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May 30, 1949

STEEL

The Magazine of Metalworking and Metalproducing

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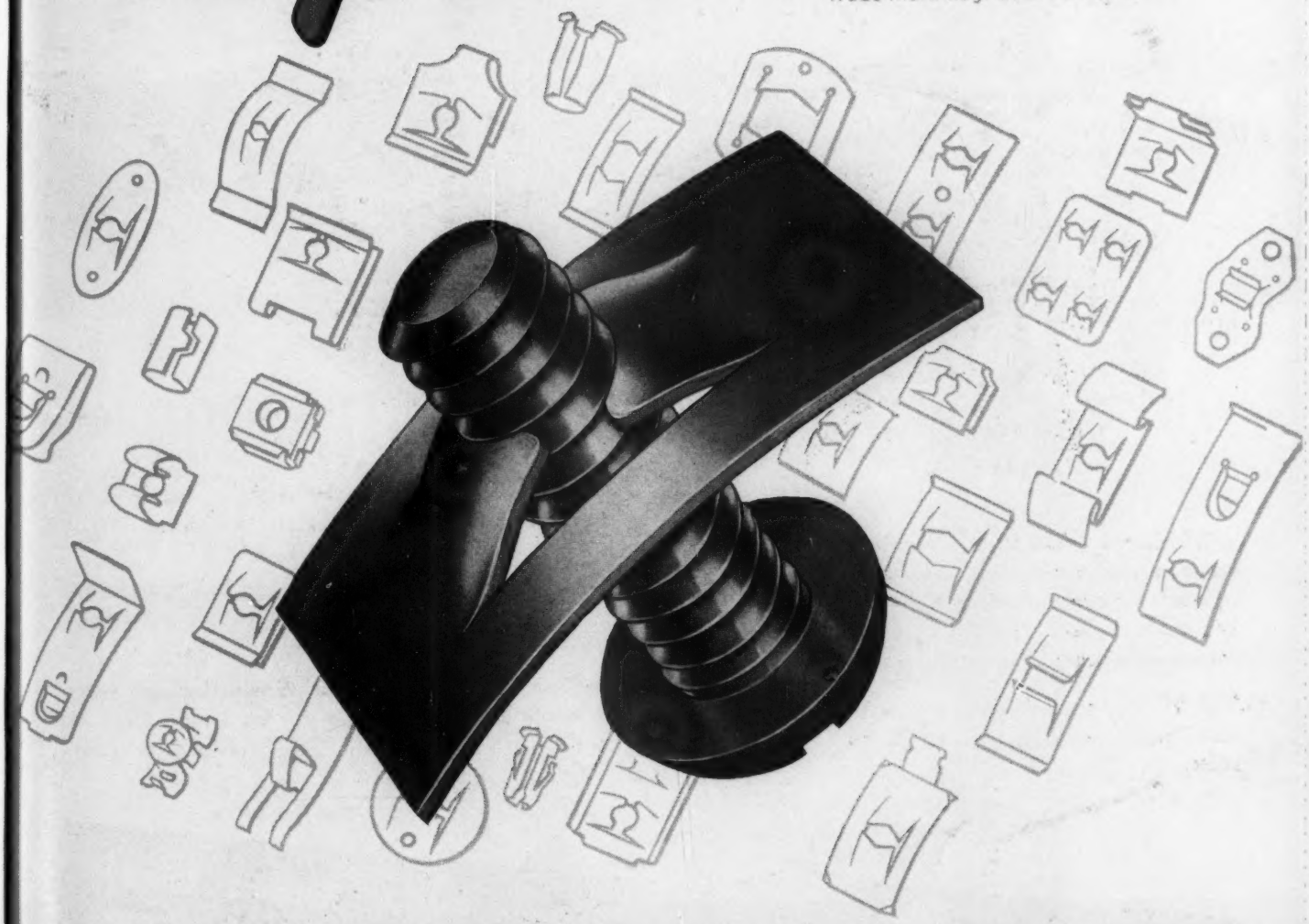
TINNERMAN

Speed Nuts

Trade Mark Reg. U. S. Pat. Off.



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Behind the Scenes...

Line's Shorter

Today's issue is no doubt being read by very few people on the date of publication. About half the population is out trying to murder the other half on the highways and byways, so there are very few of us left to work. However, all 204 of you readers will probably be back in harness by Tuesday, so we're hopefully addressing our remarks to you all. Since this is the opening of the summer season, we should probably be breezy in our colyume this week. As a matter of fact, things don't look too bad around here. Across the street the line of unemployed worming its way into the compensation bureau has dwindled to almost nothing, and the street is no longer clogged with their automobiles.

Ipchol, Smipchol, It's Great

From behind the iron curtain in North Korea comes a report of an amazing new development. This comes from the Communist radio up there, and of course must be accepted as gospel, Russian style. They've found some new stuff called "ipchol". You take some pig iron, mix it with ipchol, heat in an electric furnace for 7 hours, and lo, behold, it's steel. We expect next to hear that you can also take some iron ore, mix it with ipchol, and it will come out pig iron. That could go on and on—in fact, ipchol may be the stuff that alchemists and their descendants have been chasing for the past several centuries. Added to all the other things invented by prominent Russians, including Marconi's wireless, Bell's telephone and Wrights' aeroplane, now can be added ipchol. If they can produce it in quantity, it would probably pay off the lend-lease account in a few months.

Our Complex Worries

If you are given to worrying about the future, here's a juicy new subject which you can sink your worry warts into and really work up a good one. Walter Carroll, over at Republic Steel, says that Guy Hubbard's recent treatise on technical societies, which pointed out how special interests within one technical group often generate a new society, is not worth worrying about. According to Mr. Carroll, the trouble is just the opposite. He quotes an article from one of the daily newspapers where an editorial writer, apparently dreaming thoughts beyond his ken, forecasts the future of the steel industry, and for that matter, of all metalworking, something like this: "Imagine a big field on which a machine would be digging for ore. The machine would drag the stuff out of the earth, refine it and otherwise process it until at the end another section of the machine would stamp out parts and actually put them together." There you have it, folks. We're not arguing with the possibility of such a machine's ultimate existence and operation—not at all. It's highly improbable right now, true, but maybe some day that principle will be in use. What we're thinking about as a real source of worry is the elimination of all these technical societies which operate in this metalworking industry of ours. With only one machine doing the whole job from mine to finished product, what point would there be in having separate organizations? And as long as we're going to reorganize the technological hierarchy of our industry into one integrated unit, perhaps we ought to give it a name commensurate with the activity which that future society will require of it. We might just call it the Society of Button Shovers, for example. Now *there's* something worth worrying about!

End of the Book

Just to satisfy our curiosity, we looked in last week's book to see what the final editorial item was. We found a lot of interesting things on the final editorial page, including the fact that the Smith Gin Co. is building a $115,000 gin mill at Odem, Tex. That's not what you're thinking, either. It's cotton! But the last item of all is a price quotation on technical molybdic-oxide, which is currently running 95c per pound of contained moly, f.o.b. Washington, Pa.

Puzzle Corner

As Ralph Pappenheimer and many others of you discovered, the gals of two weeks ago were a bit on the youngish side, having as respective ages 8, 5 and 3 years. This week we are climbing an escalator. Just ahead of us are a professor and his wife. They started out at the bottom together, but every time she took one step, he took two. At the top they compared notes, found he had taken 28 steps to her 21. How many steps were in view at one time on the escalator?

Shrdlu

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STEEL

Vol. 124—No. 22 May 30, 1949

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NEXT WEEK . . .

Purdue Machine Tool Laboratory Keeps Pace With Improvements

How Boron Affects Steel Hardenability

Vapor Blasting Precision Parts

Production of Hot and Cold Rolled Sheet and Strip

STEEL

The Magazine of Metalworking and Metalproducing

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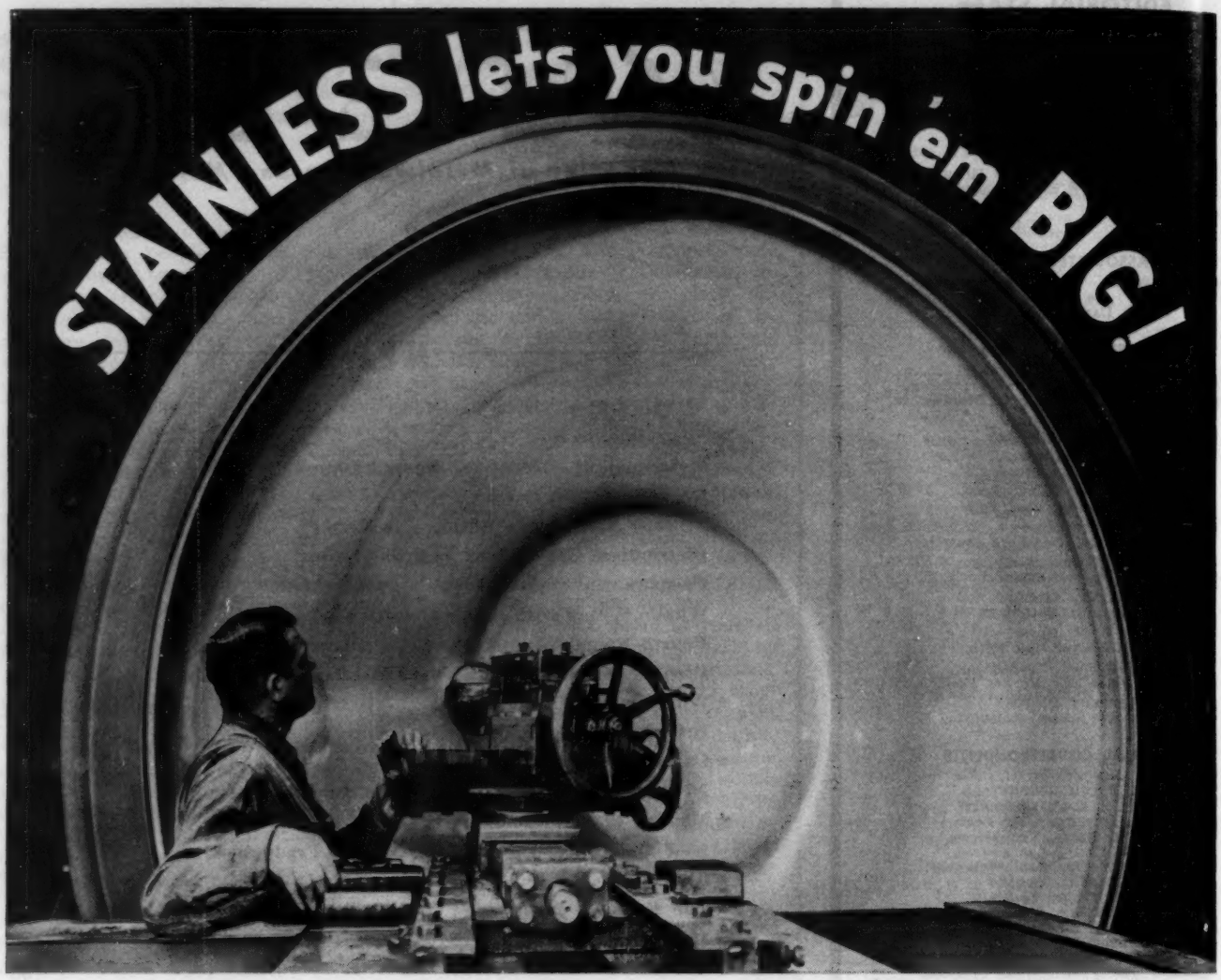
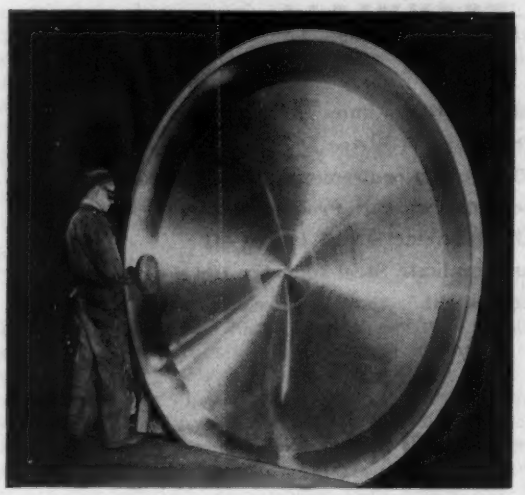


This large stainless steel tank end being spun to the desired radius is made up of standard width sheets of "18-8" welded together and the welds ground smooth.

(Below) Another large stainless steel tank end, already spun to shape, shown here being polished.



HERE is austenitic chromium-nickel stainless steel, Type 305, being spun into a huge tank end. Another, of Type 302... spun to shape and receiving a polish... is pictured at the left.

These large units attest to the adaptability of austenitic stainless steels to this method of fabrication.

Types 302, 304, and especially Type 305, lend themselves well to modern spinning operations according to the producers of these tank ends, Milwaukee Metal Spinning Company (Spincraft) of Milwaukee 8, Wisc. On a production basis, this company spins heads and ends for milk storage tanks ranging from 36 to 102 inches in diameter.

This is only one of many applications in which advantage may be taken of the various useful properties of chromium-nickel stainless steels.

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May 30, 1949

Need Understanding

If it were possible to take samples of all of the excellent addresses presented at the 57th general meeting of the American Iron and Steel Institute in New York last week and to send them to a laboratory, as one does samples of a heat of steel, the report from the laboratory would show that these addresses contained, in addition to normal proportions of the traditional elements, a higher percentage than heretofore of two special ingredients.

These two ingredients are, first, complete confidence within the steel industry that its management is doing an excellent job in running the internal affairs of its business and, secondly, great concern as to what the industry can do to make its policies and actions better understood by its employees, the public and the government.

Almost everybody will agree with the warning issued by Walter S. Tower, president of the institute, that steelmakers probably will continue to be the targets of "economic harpies" no matter how good a job the industry does in serving the public interest. Most persons also will believe in the sincerity of Secretary of Commerce Charles Sawyer when he stated flatly that "contrary to any rumor you may have heard, the government never intended to take over the steel business of the United States."

But more important than what the "economic harpies" say or what any present official of the government may say currently is the attitude of the people. Their will will prevail in the long run. If they continue to mistrust business and choose to follow the trend of most other nations, then we will drift farther into socialism and into nationalization of the steel industry.

That is one reason why it was refreshing to hear Clarence B. Randall, president of Inland Steel Co., propose that the industry embark on a new search for risk money and understanding. The two are really one and the same thing, he explained, because "a man who invests his money with us will automatically get understanding."

However practical or otherwise this suggestion may be, it has the merit of focusing attention upon two great needs of the steel industry. These needs are money and understanding. Of the two, the latter is by far the more important.

* * *

PIECEMEAL ADJUSTMENT: Editors of this publication have just queried representative metalworking companies as to the business outlook. The study covered a cross section of metal fabricators and manufacturers of machinery, electrical equipment, transportation equipment and instruments. No primary metal producers or primary automobile manufacturers were included in the survey.

The returns range from optimism to bearishness. Of those who expressed opinions on the business outlook, 23 per cent expect business to improve during the next seven months, 34 per cent anticipate no marked change and 43 per cent think business will get worse.

Four out of five companies report backlogs of orders have declined. New orders booked last month were below those received last December or in April, 1948. Steel inventories, measured in days of operations, have increased steadily during the past year. Of the companies reporting 55 per cent have cut selling prices from 1 to 20 per cent. The average reduction is from 5 to 10 per cent.

These returns are encouraging in at least one respect. The fact that 57 per cent expect busi-

(OVER)

ness to hold at present levels or improve and that 43 per cent expect further declines suggests that the adjustment of individual companies to new conditions is being staggered over an extended period. Some are farther advanced in the adjustment process than are others. The promise of "ups" to partially offset the "downs" is a favorable sign. —p. 27

* * *

JOBBERS ARE REALISTIC: Discussion at the 40th annual meeting of the American Steel Warehouse Association at Atlantic City centered around the problem of adjusting operations to meet the conditions of the present buyers' market.

Walter S. Doxsey, president of the association, outlined realistically the various factors involved in this adjustment. He told warehousemen that demand for steel will not override supply in the foreseeable future, that the percentage of steel output distributed through warehouses henceforth cannot be expected to be as high as it was during the recent period of steel scarcity and that the number of steel outlets, which increased from 1400 to more than 2000 since V-J Day, will be reduced sharply as a result of competition.

Some new factors will affect the pattern of warehouse operation in the future. High freight rates and Supreme Court rulings encourage small warehouses at remote points. The area served by the individual distributor may be smaller. In general, steel jobbers do not think that price reductions are warranted under present conditions. —p. 30

* * *

WAR ON AIR POLLUTION: Recent experiences with smog in a number of industrial areas in the United States have brought about a new surge of interest in the problem of controlling air pollution. Not only are public officials more alert to violation of ordinances covering smoke and other air contaminators but industrial executives are more determined than ever to find means whereby their plants cannot be accused of contributing to undue air pollution.

As a result, many companies are attacking the smog problem with increased vigor. A smoke sleeve developed to capture smoke arising from the charging of by-product coke ovens has been installed by one company in western Pennsylvania and another soon will be installed on ovens in Ohio. A steelmaker near Pittsburgh has launched a program to combat smoke and dirt from coke ovens, blast furnaces and steam locomotives. Makers of electrostatic air cleaners estimate that sales of their equipment in 1949 will run far ahead of those in 1948. —p. 39

* * *

CONDUCT CLINIC ON PR: Down-to-earth comments on industry's public relations problem were voiced at a clinic at Chicago sponsored by the Illinois Manufacturers' Association.

Clifford Hood, president of American Steel & Wire Co., said that salesmen of the free enterprise system should know their product, as well as that of their competition, and sell it boldly and as aggressively as one would sell any other commodity.

Robert Newcomb, partner, Newcomb & Sammons, criticized the quality of some industrial house organs, which run to meaningless social chit-chat and "blurred pictures of babies and fish." Some union publications are doing a better job than many plant papers. He declared that a properly conducted house organ can be very effective in explaining company policy to employees and in disseminating economic truths. However, employers must present their message in simple, understandable terms. —p. 33

* * *

IRON MINING IN DESERT: One of the oddest iron ore operations in the country is that of the Kaiser Co. Eagle mountain mine in the desert 15 miles north of Desert Center, Calif., and 164 rail miles from the Kaiser blast furnaces, steelworks and rolling mills at Fontana.

Proven reserves at Eagle mountain are estimated at 25 million tons of ore analyzing about 54 per cent iron content. One of three deposits, Bald Eagle, is mined by slicing down a mountain to uncover the ore which is transported by motor trucks to a crushing plant and rail head at the mountain's base. The Kaiser railroad, which carries the ore 52 miles to a connection with the Southern Pacific, ranges in elevation from 190 feet below to 1372 feet above sea level.

Currently 2000 tons of ore are shipped to Fontana daily. When the second blast furnace is blown in the daily movement will be stepped up to 4000 tons. —p. 60

E. L. Shaner

EDITOR-IN-CHIEF

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News Summary

HOW'S BUSINESS— Nearly three out of five metalworking executives canvassed by STEEL believe business will improve or hold steady over the remainder of the year (p. 27). They report that incoming orders, shipments and backlogs are lower than a few months or a year ago. Steel inventories, measured in days of operations, are higher. Prices have been reduced by half the companies, with some now entering the second round of price reductions . . . . Dwindling demand for merchant iron (p. 28) has caused Republic Steel to take a Cleveland stack out indefinitely . . . . Some metalworking companies which cut back operations earlier this year when inventories of finished goods began to pile up now find such inventories have been assimilated and are stepping up operations to keep pace with current demand (p. 28).

RETURN TO PREWAR— Warehouse steel distributors, meeting in Atlantic City last week, acknowledged that their share of total steel distribution is returning to the prewar pattern (p. 30). In the future, more attention will be paid to soliciting the orders of the smaller users, which many consider the rightful province of the warehouse. Some of the fly-by-night operators in the trade are expected to fade out of the picture.

WORKERS, FARMERS AS CAPITALISTS— Heavy industry must look to the two most politically powerful groups in America for their future new capital, American Iron & Steel Institute members were told (p. 31) by Clarence B. Randall. If the savings of these two groups are invested in industry, better political understanding will be assured. Until then, industry probably will continue a target for "economic harpies."

PR NEED OVERHAULING?— Public relations programs of industry generally came in for a critical appraisal at a clinic sponsored by Illinois manufacturers (p. 33). The finger was pointed at house organs and other management media which pass along meaningless social chit-chat, "blurred pictures of babies and fish" and pompous platitudes by company heads under the guise of public relations. Held in favorable contrast was the labor press, which, with all its many faults, often is more effective than employers' media.

AIR POLLUTION CONTROL— Out of the smoke and smog of manufacturing centers is emerging a new industry (p. 39) designed for cleaning up the atmosphere. Companies making air cleaners and similar pollution control apparatus see themselves on the threshold of a vast expansion . . . . An increasing number of companies are becoming attentive to the problems arising from smoke and dirt . . . Two steel companies are installing "smoke sleeves" at coke plants.

MORE AUTOMATIC TRANSMISSIONS— Competition among automakers in the immediate future promises to center around transmissions, as well as prices. Studebaker's new torque-converter type (p. 41), to be made by Borg-Warner, will be watched closely, as will the new Packard Ultramatic. Meanwhile, General Motors is reported readying a new automatic for next year's Chevrolets.

FOREIGN— Materials handling equipment and other apparatus to raise production rates commanded attention at the British Industries Fair (p. 37). Although Britain's steel output may rise to more than 17 million tons this year, it still will be 3 million tons short of what is needed. . . . Indian officials are studying recommendations for a large-scale steel expansion . . . . Canadian demand still exceeds output.

HERE AND THERE IN INDUSTRY— Caterpillar Tractor Co. has started full production of diesels at its new Peoria plant (p. 44) . . . . Bethlehem Steel is building a new battery of coke ovens, new ore handling facilities and other equipment at Sparrows Point (p. 44) . . . . General Motors has reduced auto prices for the second time this year (p. 42) simultaneously with making a wage adjustment under its cost-of-living contract with the union . . . . A new engine advisory committee has been named (p. 36) by the Munitions Board . . . . Proposals for stockpiling scrap have been shelved temporarily (p. 34).

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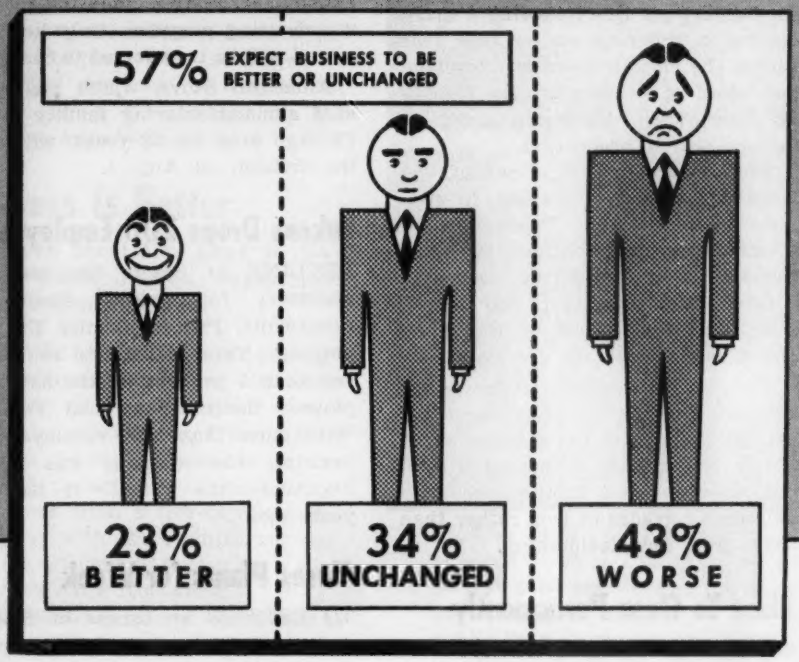
Metalworking Executives Report Their Views on . . .

THE BUSINESS OUTLOOK

for the Remainder of 1949



Era of competition has returned. Volume of incoming business lower. Backlogs, still substantial, are diminishing. Half of manufacturers have reduced selling prices. Some report inventories of finished goods assimilated

MAJORITY of metalworking executives believe business will hold steady or will improve during the remainder of 1949.

A sizable minority, however, expects volume to drop further and conditions to become more competitive as the year progresses.

Four out of five companies report backlogs of unfilled orders have diminished.

New orders booked last month are below those received in December and in April, 1948.

Shipments also have declined.

Steel inventories, measured in days of operations, have increased steadily during the past year.

Slightly more than half of metalworking companies have cut prices, with reductions generally ranging between 5 and 10 per cent.

These are some of the highlights of a survey of representative metalworking companies by STEEL. The study covered a large cross section of metal fabricators, machinery, electrical equipment, transportation equipment and instrument manufacturers. Primary metal producers and primary automobile manufacturers were excluded from the survey.

Opinions Vary Widely—Comments by the metalworking executives range from high optimism to business bearishness. Twenty-three per cent expect business to get better during the next seven months; 34 per cent anticipate no marked change; 43 per cent think business will become worse.

Many of the executives point out that an extremely competitive situation already exists in their fields and that emphasis is being placed on two-fisted selling and in watching costs all along the line.

On the brighter side, some point out that they cut back production too sharply early in the year, that inventories of finished goods have been depleted and that it has become necessary to step up operations to meet demand.

Others say they still are working at a high rate against substantial backlogs.

New Orders Drop — Bookings of new business in April fell off for most companies. Three out of four report April orders were less than in the same month a year ago.

About half the reporting companies said new orders booked in April exceeded those received last December. Aggregate volume booked in April, however, was substantially lower than in December.

Shipments last month were moderately lower than in either December or April, 1948.

Backlogs Dwindle — Eighty-seven per cent of companies questioned say backlogs of unfilled orders are lower now than they were last December, and 80 per cent report unfilled orders are less than they were a year ago. Aggregate backlogs of the companies surveyed are 65 per cent of what they were a year ago.

Steel Stocks Higher — Average steel inventories of the metalworking companies questioned now are equivalent to 113 days at the present level of operations. This compares with 105 days on Jan. 1 and with 86 days on Apr. 30, 1948.

Although many companies have reduced the physical volume of steel on hand, the lower rate of operations prevailing indicates an increase when measured in days of operation. Other companies say they have increased the physical volume of steel in stock since deliveries from mills became easier.

Many Cut Prices—Fifty-five per cent of companies say they have cut selling prices this year to counteract the slump in demand. Average reduction falls in the 5 to 10 per

cent range although reductions range from 1 to 20 per cent.

Most of the remaining 45 per cent have taken no action on prices and contend that high fixed labor costs make downward adjustments difficult. A few companies, mostly manufacturers of tools, have raised prices.

A limited number of manufacturers report they have made or are making the second round of price reductions to meet competition.

Executives Comment — In commenting on the business outlook, most metalworking executives admit freely that competition has become much keener since the beginning of the year.

"There is still plenty of business to be had, but it's harder to get," says one manufacturer.

"We are giving our sales force a thorough overhauling. The months ahead are going to require a real selling job," states a machinery maker.

"Our shipments and orders have been adversely affected by strikes which have tied one of our principal suppliers," says an auto parts maker. "Now we are wondering whether we will be able to recapture our market when the strike is settled, or whether our customers will continue with the new suppliers they took on during the strike."

"Business is off—substantially from what it was last year. But we still are doing twice the volume we had before the war," says another manufacturer.

"Whether we like it or not, competition has returned. Maybe it will be a healthful thing."

Republic Stack Down

Cleveland blast furnace taken off as demand for merchant iron diminishes

CONTINUATION of light demand for foundry pig iron following a sharp decline in ordering earlier this year forced the closing down at Cleveland last week of a blast furnace Republic Steel Corp. has been using in merchant iron production.

The furnace, No. 2, is one of two Republic used in Cleveland to produce foundry iron. Production of foundry iron will continue in No. 3 furnace. Those two stacks, each with a rated daily capacity of 550 tons of iron, are the smallest of Republic's five blast furnaces at Cleveland.

The company stated that no change will be made in its steel operating rate as a result of the shutting down of the No. 2 furnace inasmuch as it had been assigned to the production of foundry grades of iron rather than basic iron for steelmaking.

Plant To Close Permanently

SOME 400 employees at American Stove Co.'s Harvey, Ill., division have come face-to-face with the meaning of "retrenchment." Reasons behind the company's decision to close its Harvey facilities permanently were explained recently to union representatives and to Harvey's mayor by President Arthur Stockstrom.

Stating that economic conditions could not be ignored and that the company's facilities at St. Louis are ample to take care of all domestic range production now or in the foreseeable future, Mr. Stockstrom explained that more efficient operations will be obtained by combining the two plants. He declared it will be the company's intention in selling the Harvey facility to have it occupied by a concern which will furnish employment rather than use it for warehousing purposes. Only key personnel will be transferred to St. Louis.

American Stove, which has operated a manufacturing facility in the Chicago area for 52 years, will close the division on Aug. 1.

Lukens Drops 200 Employees

DECLINE in orders has made it necessary for Lukens Steel Co., Coatesville, Pa., to dismiss 250 employees. These constitute somewhat less than 5 per cent of the 5369 employees the company had Feb. 19. With more than 5100 employees remaining, the company has almost 2½ times the number it had ten years ago.

Closes Plants for Week

TO REDUCE an excess of finished inventory, Thew Shovel Co., Lorain, O., kept its five plants, all in Ohio, closed last week. Two of the plants are in Lorain, two are in Elyria, and one is in Bucyrus. Production was scheduled to be resumed May 31.

650 Laid Off by Westinghouse

WESTINGHOUSE Electric Corp. has laid off an additional 650 employees at Mansfield, O., because of a lack of orders. Since January, the reductions made by all Westinghouse plants total 3450 employees.

National Tube Cuts Back

NATIONAL Tube Co. has curtailed operations at Gary specialties division due to declining demand. Cut back will result in reduced work-week for some employees and possibly furloughing of 500.

Nickel Output To Be Cut

BECAUSE of reduced demand, International Nickel Co. of Canada Ltd. plans to cut nickel output by 10 per cent.

On June 1 the company is closing its one reverberatory furnace at its Copper Cliff smelter in Canada. This, the company said, will mean a reduction of 10 per cent in nickel output.

Tin Plate Output Cut

TIN PLATE production by Republic Steel Corp., Cleveland, has been low-

CUTBACK TOO SHARP; OPERATIONS STEPPED UP

BUSINESS IS BETTER than had been expected, and as a result Republic Steel Corp.'s Berger Mfg. Division at Canton, O., is unable to make as prompt deliveries as it would like on its line of kitchen cabinets.

When demand for household appliances and equipment began to weaken late in 1948 the division pared its production to a level determined on a basis of past experience. However, that cut has proved to be too sharp, and now the division finds it necessary to step up operations somewhat at its No. 2 plant at Canton to get into line with demand.

At the Berger Division's No. 1 plant at Canton there is a seven-months backlog of orders for steel lockers. This demand comes largely from industrial plants and schools. Because of the increased birth rate of the past several years and an increasing school enrollment, the Berger division foresees a strong future demand for lockers for schools. Currently, 35 per cent of the division's locker business is coming from schools.

Increased availability of steel is facilitating production in the division's two plants. Officials of the division pointed out that during the heavy postwar demand for steel Republic held its manufacturing division plants down to the same basis of allocation as prevailed for independent customers.

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ered from 100 per cent of capacity to 75 per cent as a result of reduced ordering by can makers, who are reported to be decreasing their inventories of raw material.

Demand for tin cans has been reported affected by a considerable carryover of canned goods from last season, with a result can makers' inventories of plate were too large.

Republic produces electrolytic tin plate at Niles, O., and hot dip tin plate at nearby Warren, O.

Business Is Better

Truscon Steel Co. goes to six-day week in one department and expands others

IN CONTRAST to the "unwinding" process current in so many businesses today, one of Republic Steel Corp.'s fabricating subsidiaries, Truscon Steel Co., has boosted operations in the bar joist department of its Youngstown plant from a five-day to a six-day pace, with three shifts per day. That department had been on a five-day week since November.

The expanded rate of operations is made possible by a continuing substantial demand for bar joists and by the increased availability of steel for fabricating that product. Overtime rates will be paid for work on the sixth day.

Various other departments of Truscon's Youngstown plant have been stepping up operations by going from two shifts to three shifts per day in a five-day week, or by increasing the number of employees per shift. Of 400 employees laid off late last year, Truscon has been able to take back all but 150, according to D. K. Forsyth, works manager. Approximately 1650 shop employees are now on the payroll at the Youngstown Truscon plant.

Sales Rate Exceeds Record—Truscon's sales currently are at an annual rate of half a million dollars over 1948, the company's record high year. Much of the company's business is coming from the so-called monumental type of building construction—such as schools, colleges, hospitals and telephone buildings. Truscon also is filling an order for three of the world's biggest radio-radar towers for the U. S. Air Force.

Because of its experience in building radio transmitting towers, Truscon is getting a big share of the business of constructing towers for the growing television industry.

TV Set Producers See Good Year

MAKERS of parts for television and radio sets are expecting 1949 to be one of their most profitable years despite declining radio set output.

The peak year for overall television and radio production was 1947 when 20 million radio sets and 175,000 TV receivers were turned out. Last year radio output dropped to 16.5 million sets and television production neared the million mark. That trend is expected to continue this year.

The Radio Manufacturers Association estimated 1949 production of radio sets will be 10 million units and TV output about 2 million sets. The 2 million television sets will require as many overall component parts as the 20 million radio unit production of 1947.

Truscon Steel Co., Youngstown, where these steel windows were being removed from a conveyor line continues to experience business good enough that sales are at an annual rate of a half million dollars over its record year of 1948. *The company, a fabricating subsidiary of Republic Steel Corp., has stepped up one department to a six-day week and in other departments has either increased the number of shifts or the number of employees*

Television Set Prices Drop

TELEVISION receiver price cuts of about $45 a set have been made by Magnavox Co., Ft. Wayne, Ind.

GE Increases Discounts

REDUCTIONS in net prices ranging from one-half of 1 per cent to 7 per cent on polyphase and direct current electric motors and generators from one to 200 horsepower will be realized by most purchasers as a result of a new motor and control sales and discount plan of General Electric Co., Schenectady, N. Y.

The plan extends increased discounts to most purchasers served by the company. The reductions, the company said, represent more than $1 million in annual savings to these customers.

Frigidaire Cuts Prices

PRICES of 13 household refrigerator models have been reduced from $5 to $23 by General Motors Corp.'s Frigidaire Division, Dayton, O. M. M. Roberts, general manager of Frigidaire, said the new prices bring the retail cost for Frigidaire household refrigerators down to the 1939 average of about $32 a cubic foot.

Extras Cut on Stainless Steel

GAGE EXTRAS on light-gage stainless sheet were reduced last week by Washington Steel Corp., Washington, Pa.

The reductions, starting with 27-gage and extending through 36-gage, result in savings to the purchaser of from 11.66 per cent to 26.67 per cent per square foot of sheet.

Building Wire Prices Fall

BUILDING WIRE has been reduced in price by another 10 to 15 per cent by General Cable Corp., New York. This makes the total cut for building wire 35 to 40 per cent since the beginning of the year.

Distributors See Prewar Pattern Return

Warehouse operators resigned to drop in volume from postwar levels, and in share of steel distribution. Prepare to solicit small orders, which they consider rightful province

STEEL warehouse operators are acutely conscious of the return of the buyers' market. The day of the easy sale is over, they know. From now on the going will be much rougher than it has been since before the war, and in the struggle for survival a lot of fly-by-night distributors are going to fall by the wayside.

That was the general tenor of thinking of the 40th annual meeting of the American Steel Warehouse Association at the Ritz-Carlton, Atlantic City, N. J., May 23-24, which attracted record attendance.

Biggest problem before the industry today concerns its adjustment to the slower tempo of demand which is accompanying the return to more normal market conditions.

President Walter S. Doxsey bluntly told the meeting demands for steel will not override supply in the foreseeable future and that the prewar pattern of warehouse participation in overall steel distribution will replace the postwar experience.

Postwar Volume High—As shown in the accompanying chart, warehouses distributed substantially larger major product tonnages, percentage-wise, during the postwar period than they did prewar. But this isn't the only gage of the rarefied atmosphere in which the industry has been soaring since the war. In 1940 dollar sales of a selected number of typical warehouses amounted to $50 million. In 1948 these same distributors' sales totaled $250 million. They did as much business in that one year as they did in five years like 1940, and even when this dollar volume is adjusted to a ton basis, the ratio is better than 3 to 1.

The steel distributors are resigned to a drop in volume from inflated postwar levels. They know that with the steel scarcity past many of the abnormally large orders they have been handling since the war will from now on be serviced directly by the mills. Average size of warehouse orders is bound to drop, distributor participation in overall shipments shrinking correspondingly.

Some Over-Expansion—There is no question the steel warehouse industry faces the consequences of over-expansion in certain areas. In some directions the growth has been normal; in others it has been opportunistic and transitory. Total number of steel outlets has increased since the war from about 1400 to more than 2000.

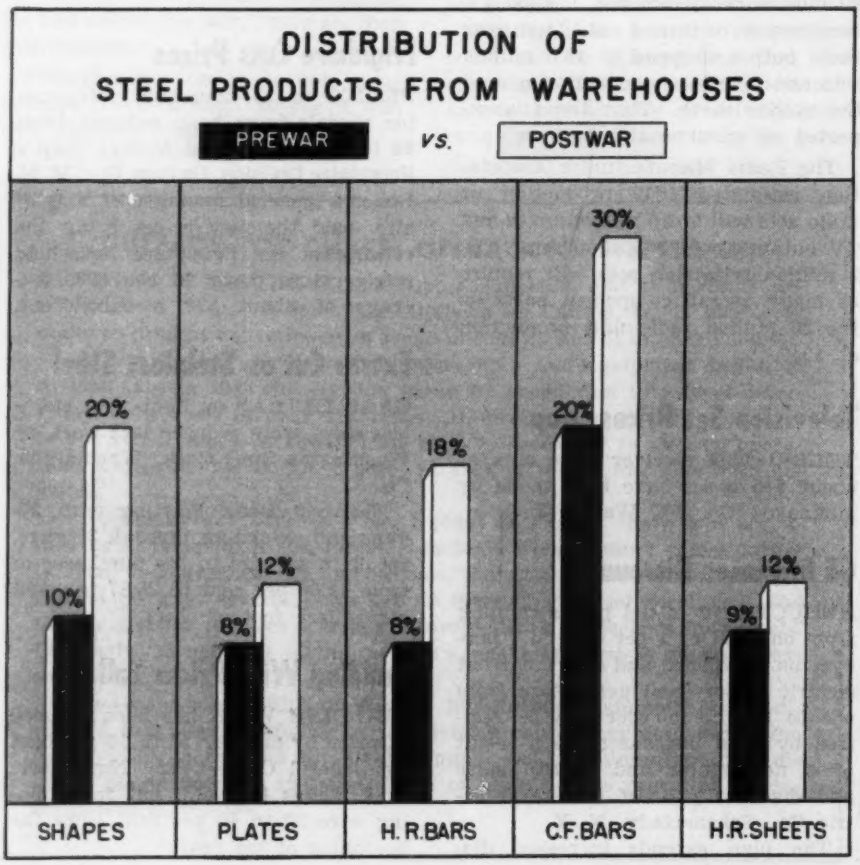
However, this doesn't mean that the excess of jobbers in relation to demand will be quickly and easily overcome. Far from it. Greatly increased freight rates have compressed the marketing areas of individual jobbers, and aside from the handicaps imposed by adverse rulings of the Supreme Court with respect to freight absorption, higher freight costs have encouraged and will continue to encourage the establishment of many small warehouses at outlying points, thus contracting the markets heretofore served by long-established operators.

Price Cuts Not Warranted—As a general thing, steel jobbers do not think price reductions are warranted under present market conditions. Of course, good merchandising dictates disposal of inferior and unwanted items at a sacrifice, if necessary. But a general price reduction is not justified as yet in light of the stability exhibited in mill prices.

An outstanding feature of the meeting was a panel discussion of how f.o.b. pricing has affected steel warehouse buying and selling. Discussion was led by A. W. Herron Jr., Pittsburgh, and was participated in by James D. Taylor, California chapter; Johns Congdon, New England; Peter Capio, New York; Wallace D. Hall, Philadelphia; W. B. Huntley, Buffalo; J. W. Schlendorf, northern Ohio; Frank Pidgeon, South; Marvin B. Marsh, Kansas City; Lawrence C. Klump, Texas.

Officers Elected—Mr. Doxsey was re-elected president of the association to serve his ninth successive term. C. H. Bradley, W. J. Holliday Co., Indianapolis, was elected chairman of the executive committee, while James D. Taylor, Taylor & Spotswood Co., San Francisco, and F. W. Krebs, Super Steels Inc., Cleveland, were named vice presidents. Fred C. Flosi, A. M. Castle & Co., was re-elected treasurer.

Honorary memberships in the association were given for outstanding contributions to the advancement of the organization to six men who have retired from active business. They are: Guy P. Bible, Horace F. Potts Co., Philadelphia; A. C. Castle, A. M. Castle & Co., Chicago; George Gibbs, Gibbs Steel Co., Milwaukee; Charles Heggie, U. S. Steel Supply Co., Chicago; Charles Kramer, U. S. Steel Supply Co., Newark, N. J.; Ralph J. Stayman, Jones & Laughlin Steel Corp., Pittsburgh.



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Farmers, Labor as Industry's Partners?

New risk capital to come from these politically powerful groups, Steel Institute members told. Broadening of ownership base may bring better understanding for industry

RISK capital for the future growth of heavy industry may have to come from the savings of the workers and the farmers, the two most politically powerful groups in the country.

When and if this takes place, industry may obtain a better understanding, for the owners of a business seldom want it nationalized or too seriously interfered with by the government.

Until then, industry can expect to remain the target for "economic harpies" regardless of the excellence of its performance.

These were some of the thoughts placed before the 57th general meeting of the American Iron & Steel Institute at the Waldorf-Astoria in New York, May 25-26.

Look to Farmers, Workers—The steel industry must look to the two most powerful political groups in America, the worker and the farmer, for its future financing, said Clarence B. Randall, president, Inland Steel Co., Chicago.

Taxation, he said, has made the few remaining rich negligible as a source of money. The worker and the farmer in the aggregate have sufficient savings to relieve the capital stress in heavy industry. But at the present, neither of these groups is devoting its savings to the purchase of common stocks of steel companies.

Heavy industry needs both the money and the understanding of these two groups.

Mr. Randall offered the suggestion that the money and the understanding which he cited as the industry's needs are really one and the same thing. "By this I mean that a man who invests his money with us will automatically get understanding. I know of no stockholder in our business who wants to liquidate the company, or who desires to have it nationalized."

As between the worker and farmer, Mr. Randall said, "The worker must obviously be our primary responsibility. Our first effort must be directed toward him. We know that even on the basis of prewar costs it required $10,000 of new money to provide an extra job, but he doesn't. And if he does, he doesn't see that it is any concern of his.

"Quite frankly, I have no idea whatever of how best to sell common stock to the worker. I can, however, suggest some bench marks.

No Employer Pressure—"One thing is certain and that is that there must be no employer pressure. Our job is to explain, and to create an atmosphere of understanding, but the action must be altogether voluntary on the part of the worker. He must take the risk eagerly because his self-interest is aroused, but he must do it with his eyes open. He will obviously need help on the mechanics. Few steel plant employees know the name of a dealer in securities, and yet our objective must be if possible to help educate the public to the usual methods of trade."

Farmer Offers Special Problem—The farmer presents a very special and different problem. "It will not be easy to draw him into direct partnership with the steel industry by persuading him to buy our common stocks, but the resulting benefit to the cause of free enterprise will be worth tremendous effort."

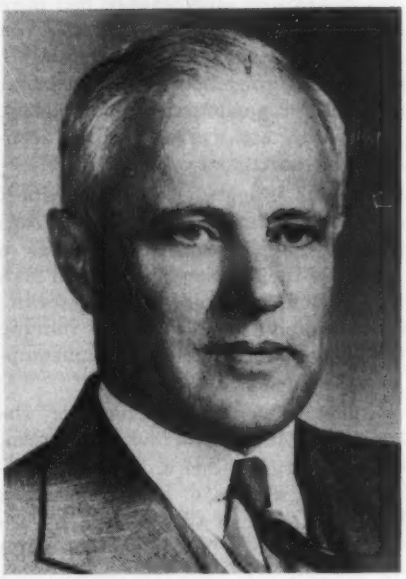
Steelmakers were told they probably will remain the target of "economic harpies" and will face the issue of government intrusion in spite of their record high production and large scale expansion, by Walter S. Tower, institute president.

"Ideas may lie dormant, or change direction, but zealous planners are persistent and patient. They rarely let their ideas die," said Mr. Tower. "The 'economic harpies' would pull steel down from its high place among the products of private initiative and enterprise by putting its future in the hands of untried theorists."

Mr. Tower pointed out that in the first four months of this year, steel output reached the rate of almost 96 million tons a year, a figure which "must seem almost incredible to men in other parts of the world." However, he said, critics of the steel industry show a general lack of understanding of the simple economics of steelmaking and have little concept of what makes the industry different from others.

"Failure to recognize these essential features in the economics of steel may explain part of the faulty theorizing about future steel supply, in which estimated needs have been figured from projections of top levels in abnormal periods. However, there

CLARENCE B. RANDALL



KARL T. COMPTON

HUGH MORROW

CHAIRMEN OF INSTITUTE TECHNICAL SESSIONS

H. W. JOHNSON
Vice President, Inland Steel Co.

A. V. WIEBEL
Vice President, Tennessee Coal, Iron & Railroad Co.

C. E. DAVIS
Vice President, Alan Wood Steel Co.

R. S. POISTER
Vice President, Crucible Steel Co. of America

are some reasons for thinking that the subject of steel supply has been made to serve as a handy peg, on which little people playing with big ideas hang proposals for government controls or participation in industry, to fit the notion of a 'planned economy' or 'socialized industry' ".

Surplus Suggested — The prospect in the steel industry today is "suggestive of potential surplus," as a result of the industry's continued high production, and there is "some feeling that supply may now be running ahead of actual current consumption," said Mr. Tower.

Speaking on the "Trend of the Times," Hugh Morrow, chairman, Sloss-Sheffield Steel & Iron Co., Birmingham, warned of the undermining of the American way of life by so-called liberals acting under one guise or another.

The country, he continued, is now spending more for government in one year than it cost to conduct World War I, or more than $111 million daily.

Hits Unequal Laws—"The new order, having found that men were unequal under equal laws, endeavored to make them equal under unequal laws," said the speaker, with the result that "no one suffers anything from inactivity."

American business concerns need more top executives who are more than good administrators, said Sumner H. Slichter, Lamont University professor at Harvard University, Cambridge, Mass., at the industrial relations session, which was presided over by J. M. Larkin, vice president, industrial and public relations, Bethlehem Steel Co.

In addition to being good administrators, executives should be wise students of conditions and ideas, capable of protecting business "from the kind of blunders which created the present hostile environment for business, able to hold their own in intellectual competition with the best thinkers of this age and qualified to assure that business contributes its proper share of the important ideas that determine the course of history."

Few periods in history, he said, have seen such rapid changes as the last century. This rapid rate of change is still going on, he said. He discussed briefly some of the principal changes which have occurred in the economy and then a few of the problems which have been produced by these and other changes.

Military Aid Drain Slight—Program to supply military assistance to Europe will have little effect upon this country's total national economy, said Karl T. Compton.

Requirements for all security programs, domestic and foreign, will amount to about 6 per cent of United States output of steel and aluminum. For copper, the requirements will exceed 15 per cent, Mr. Compton said.

All foreign aid requirements, including military aid, will take less than 2 per cent of total steel production, less than ¼ of 1 per cent of aluminum, somewhat more than 4 per cent of copper, for which ECA requirements are sizable.

Mr. Compton, who is chairman of the Research & Development Board, and chairman of the Massachusetts Institute of Technology, delivered the third Charles M. Schwab Memorial lecture.

May Reduce Military Spending—Mr. Compton believes that in the long run, the foreign aid programs will enable this country to lessen its military expenditures. However, he said this would not be realized for several years or until an adequate and co-ordinated defense system is established in Europe.

Going Back to Normal—The current economic situation is in transition from a high inflationary peak to a normal plateau, Secretary of Commerce Charles Sawyer said in his institute address Thursday evening. He cautioned against ill-considered, frightened action on the part of business and the public. "Our economy is very strong, American business is in a most healthy condition, economic activity is at a high level and can remain so," he said.

Four technical sessions featured the afternoon's program on Wednesday. They related respectively to increasing production in the open hearth, control of sulphur in steelmaking, research in steelmaking and general research (see p. 88).

Edwin D. Martin, assistant manager of the metallurgical and inspection department, Inland Steel Co., Chicago, was awarded the American Iron & Steel Institute medal.

EDWIN D. MARTIN

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What's Wrong with PR?

Illinois manufacturers study weaknesses of programs for selling industry to public

INDUSTRY'S public relations programs were given a critical examination at a clinic sponsored by the Illinois Manufacturers' Association at Chicago May 19 and attended by more than 300 manufacturers. Speakers at the clinic pulled no punches in telling business what was wrong with their approach to the problem of selling the public on the free enterprise system.

Potentially fatal illnesses from which some of the current public relations work is suffering were diagnosed by Elmer Walzer, financial editor, United Press, and Robert Newcomb, Newcomb & Sammons, Chicago.

Mr. Walzer quoted some replies he received from top public relations men to his question, "What's wrong with public relations?" Through many of these answers ran the complaint which one expert put this way: "Corporation officials too often come with half-shut minds and half-shut fists. They are willing and able to make adequate appropriations for the introduction of a new product, but they too often are unwilling to do the same for a new idea. No corporation to my knowledge has an adequate budget for even a good labor relations program, and this is only a quarter, at most, of its public relations program."

Blurred Pix of Fish and Babies—Mr. Newcomb criticized the quality of management's communications media. House organs, for example, too often are devoted to meaningless social chit-chat and "blurred pictures of babies and fish." Management statements too often are pompous and remote from the worker's everyday life.

In contrast, said Mr. Newcomb, the labor press is devoting its attention to problems of more social and economic significance. While holding no brief for the union publications, he opined they are doing a better job than many company papers.

He advised employers to forget the high-sounding but meaningless-to-employees platitudes and to present their picture in simple, understandable terms.

Know Your Product—The good salesman should know the product he is trying to sell—in this case free enterprise—and also the product the competition is peddling, said Clifford Hood, president, American Steel & Wire Co., Cleveland.

The competition to free enterprise, he said, is offering three philosophies: 1. That the theory of profit should be junked and replaced by social ownership; 2. that the government should be even more deeply involved in the affairs of business; 3. that union leaders should control prices to consumers and should take over an ever-increasing share of the duties of management.

To meet this competition, said Mr. Hood, business should sell our enterprise system. "Sell it with the same boldness and aggressiveness that we're using to sell our products. Sell it as you would any other commodity."

Watch Wage Talks

Settlements may determine future course of business. Steelworkers ask 15 cents

WAGE discussions, now starting in the metalworking and other industries, may go far in determining the future course of business, industrial executives believe.

Should substantial rate increases be granted, or should costly insurance and pension programs be granted, employers will face a serious dilemma. They cannot increase prices without meeting increasing buyer resistance. On the other hand, profit margins at today's level of business will not permit industry to absorb further cost increases.

Steelworkers Ask 15 Cents—First indication of the wage demands of the United Steelworkers came in the union's proposals to Timken Roller Bearing Co., Canton, O., for a 15-cent hourly increase, plus $150 a month pensions.

Negotiations between the steelworkers and the Aluminum Co. of America started last week, although the union demands were not immediately revealed.

Preliminary discussions between other leading steelmakers and the union are scheduled to start early in June. Inland Steel last week said it is willing to discuss both wages and social security issues.

Coal Talks Start—Negotiations between the Southern coal operators and the United Mine Workers got under way to a faltering start at Bluefield, W. Va., last week with the usual bickering.

United States Steel Corp. has informed John L. Lewis that its representatives will discuss a new contract with the coal miners, preferably after agreement is reached with commercial operators, or, if Lewis is adamant, before such an agreement is reached.

Manganese from Slag

Cleveland firm develops process to recover scarce steelmaking material from open-hearth slag

NEW PROCESS for recovery of manganese from open-hearth slag may make every open-hearth slag dump a potential manganese mine and may ease the shortage of this material vital in steelmaking. Credit for the new development goes to Dr. Robert A. Schoenlaub, vice president in charge of research, Sylvester & Co., Terminal Tower, Cleveland.

Pending patents impose secrecy on details of the process. However, the slag is treated similarly to limestone in cement manufacture. It is passed through a crusher, gas-fired kiln, etc. Later it is subjected to the conventional mineral technique like that used in ore recovery, including jigging, flotation and classification.

Central Plant Not Recommended—A central processing plant is not recommended because of the likelihood that transportation costs would offset the savings in manganese recovery. Instead, it is felt the recovery plant should be located at the steel works. A setup capable of processing 300 tons of open-hearth slag daily will provide an economical operation. At present a pilot plant to process 10 to 20 tons daily is being planned.

A 12-furnace open-hearth shop discards about 200 pounds of slag per ton of steel containing about 4 to 8 per cent metallic manganese depending upon the steel grade being made. A large percentage of the manganese in the heat finds its way to the dump. Based on an annual output of 90 million net tons of steel, about 900,000 tons of manganese is shipped in steel and about 540,000 tons of manganese goes to the dump with slag.

Steelmakers spend around 50 cents per ton to dispose of slag, but by investing $13 to $14 for processing the waste material they could recover an iron-manganese product analyzed at 33 per cent manganese, 61 per cent iron and 6 per cent carbon and valued on the market at $21 to $25 per ton. If desirable, the high iron alloy can be further processed to obtain ferromanganese of standard analysis. The high phosphorus byproduct in the form of agricultural stone can be marketed to the farming industry.

When the process is ready for commercial application, Sylvester & Co. will grant operating licenses to all interested steelmakers.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Administration shows inclination to respect businessmen's desire for nongovernment insurance of risks in connection with Truman's Point Four world program

ADMINISTRATION planning for implementation of President Truman's Point Four world program "for making the benefits of our scientific advances and industrial progress available for the improvement and growth of undeveloped areas" does not contemplate any provision for government reimbursement for losses suffered by private business firms or individuals from expropriation or any other cause.

Rather, it leans toward establishment of some sort of mutual insurance system, supported by the interested businesses, to protect American firms against losses from abnormal causes—such as expropriation, revolutions, riots and the like.

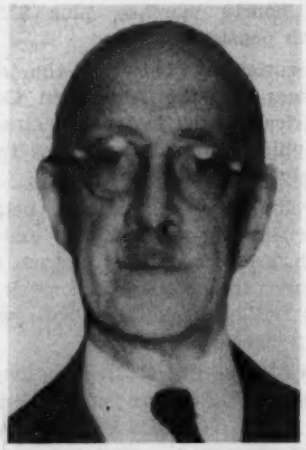
This shift results from a canvass of opinion which shows that the majority of businessmen are firmly opposed to having the government reimburse them for losses due to abnormal causes. They say such an arrangement would bring the government in as a virtual partner, with authority to audit books, etc., and they do not want that.

Assistance from Government—Present planning envisages a setup under which the government would create the framework within which private business could function smoothly. This comprehends the negotiation of treaties under which foreign governments would guarantee to compensate fairly in the event of expropriation of property or other assets of American business; setting up of central clearing house, perhaps in Washington, of information for the guidance of exporters, investors and manufacturers interested in doing business abroad; and working with other countries to stabilize foreign exchange so that dollars could be obtained in exchange for foreign currencies without undue delay.

As the program now stands, Congress would be called on to appropriate $68 million for the first year, with participating nations expected to lay out $34 million; the British, French, Dutch, Swedes and some others are expected to play active roles in imparting their outstanding "know-hows" to those parts of the world needing such help. Of the $68 million the United States would put in, $19 million is earmarked to go to the Department of Agriculture. This is because at the outset the Point Four program would aim at getting larger and more efficient food production in backward areas. Other features of the American government investment at the outset would be concerned with health and education, and construction of highways, power plants and distribution systems, irrigation systems, hospitals, schools and other activities of a fundamental character.

Long-Range Salesmanship—"If we sell a steel plow to a man in a backward country who now is using a wooden plow, we want him to be healthy enough to work with the plow, and we want him sufficiently literate so that he can read directions for using and taking care of the plow," is the way a government spokesman puts it. "After we get a fundamental pattern laid down we soon will get to the place where more countries will be able to buy more American goods."

Delay in getting the President's Point Four message to Congress is expected until four legislative programs now under study are acted upon: Ratification of the North Atlantic Pact; authorizaton of military assistance to Western Europe; extension of the Reciprocal Trade Agreements Act; and ratification of the International Trade Organization charter.



OIT CONSULTANT: Charles A. Richards, New York, has been appointed special consultant to the director of the Office of International Trade, Department of Commerce. He will survey and make recommendations to improve OIT's foreign trade promotion activities and its services to exporters and importers

On With the Work

THIS SESSION of Congress will not adjourn on the basis of a traditional calendar date, according to Rep. Sam Rayburn. The House speaker told newspapermen that "we expect to stay in session for three or four months yet, in all probability. We will adjourn when we get through with our work."

Aims at Uniform Bookkeeping

ANSWERING the Hoover commission's criticism that different bookkeeping systems make it impossible to compare the costs of like services in the Army, Navy and Air Force, Secretary Louis Johnson has set the wheels in motion for an approach toward uniformity. The three military departments have been furnished a set of category definitions of all major budget items; these are to be observed by the three services in submitting estimates of their financial needs for the year starting July 1, 1950. As soon as feasible, Secretary Johnson stated, the performance-type budget recommended by the Hoover commission will be established.

Dr. Karl T. Compton, chairman of the National Military Establishment Research & Development Board, states that budgeting on the basis of the new categories will make it possible for the first time to report just how much money the National Military Establishment spends for research and development work.

Scrap Stockpiling Postponed

THE MUNITIONS Board's inquiry as to advisability of stockpiling uncontaminated steel scrap as a hedge against a scrap shortage in the conversion phase incidental to a future national emergency has been indefinitely postponed. The subject was to have been discussed at another meeting of the Scrap Subcommittee, Iron & Steel Industry Advisory Committee, May 19, but, in view of the feeling that the scrap market still is in an unstable condition that does not lend itself to long-range planning, the meeting was canceled.

Nodular Iron Study Begun

A STUDY of cast iron containing nodular or spheroidal graphite has

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FLOOR PLATES GET THEIR ANTI-SKID TREAD on a CINCINNATI Hydro-Tel Milling Machine

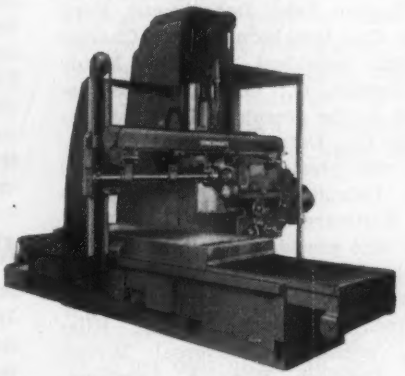
CINCINNATI No. 36-120 Horizontal Hydro-Tel Milling Machine, tooled up to mill straight or helical grooves in floor plate rolls. Straight grooves have been milled in this roll, the body of which is 77" long.

Inset: Close-up of indexing and driving mechanism for milling straight or helical grooves in floor plate rolls.

A prominent steel manufacturer mills the anti-skid tread in their floor plate rolls on a CINCINNATI 36" Horizontal Hydro-Tel. The machine accommodates several sizes of rolls, and mills two types of tread—straight or helical grooves. Of course, Cincinnati Application Engineers had a hand in this job. They equipped the machine with an index fixture which incorporates roll journal rests, and a rack attached to the bed for rotating the roll to mill the helical grooves.

A sintered carbide formed cutter is employed, cutting at a feed rate of 14" per minute. The rolls are chilled iron.

CINCINNATI 36" Horizontal Hydro-Tel Milling Machines have the capacity and range for milling large heavy work. And they have many labor-aiding and cost-reducing features. You may learn more about them by writing for catalog M-1629.



CINCINNATI 36" Series Horizontal Hydro-Tel Milling Machine. Catalog No. M-1629.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES
FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

been undertaken by the Munitions Board with the assistance of the Research & Development Board. This action results from a recommendation by the Subcommittee on Gray Iron Castings of the Munitions Board's Foundry Industry Advisory Committee that the military potentials of high-strength castings made from such iron be investigated.

Simplification Sought

THE NATION'S armed forces have been asked by the Munitions Board to give special attention to simplification in the design of military material as an aid to production.

The board also has requested the co-operation of the Weapons Systems Evaluation Group and the Research and Development Board in this program to simplify design and make producibility of material a prime factor in their individual projects. The Joint Chiefs of Staff have been asked to support the program.

New Engine Advisory Group

THE MUNITIONS Board's campaign to reduce the number of internal combustion engine types used by the Army, Navy and Air Force, and to attain maximum interchangeability of parts, has been broadened to include automotive and marine as well as industrial engines. Incidental to the change, a new 23-man Internal Combustion Engine Industry Advisory Committee replaces the former Industrial Engine Industry Advisory Committee. Membership of the committee, which held its organization meeting May 25, follows:

B. B. Bachman, vice president, Autocar Co., Ardmore, Pa.; J. F. Bachman, manager, Industrial and Marine Engine Sales Department, Ford Motor Co., Dearborn, Mich.; Charles Balough, president, Hercules Motor Co., Canton, O.; G. H. Brodie, assistant to the president, Packard Motor Car Co., Detroit; James M. Crawford, vice president, General Motors Corp., Detroit; R. E. Friend, president, Nordberg Co., Milwaukee; V. W. Fries, vice president, White Motor Co., Cleveland; R. E. Huthsteiner, executive vice president, Cummins Engine Co. Inc., Columbus, Ind.; R. Klieforth, president, Universal Motors Corp., Oshkosh, Wis.; A. Loofbourrow, chief engineer, Chrysler Division, Chrysler Corp., Detroit; H. L. Morris, chief engineer, Hall-Scott Motor Division, ACF-Brill Motors Co., Berkeley, Calif.

R. H. Morse Jr., vice president, Fairbanks-Morse Co., Chicago; A. N. Morton, vice president, Mack Mfg. Co., New York; C. E. Nelson Jr., vice president, Waukesha Motor Co., Waukesha, Wis.; E. V. Oehler, vice president, Briggs & Stratton Corp., Milwaukee; J. G. Rayniak, vice president, Outboard Marine & Mfg. Co., Waukegan, Ill.; W. D. Reese, manager of engineering, Motor Truck Division, International Harvester Corp., Chicago; P. Schnetzky, vice president, Murphy Diesel Co., Milwaukee.

E. J. Schwanhausser, vice president, Worthington Pump & Machinery Co., Harrison, N. J.; H. W. Smith, manager, Engine Sales Department, Caterpillar Tractor Co., Peoria, Ill.; S. W. Sparrow, vice president, Studebaker Corp., South Bend, Ind.; G. W. Thomas, chief engineer, Continental Motors Corp., Muskegon, Mich.; A. J. Wieland, executive vice president, Willys-Overland Motors Inc., Toledo, O.

Pig Iron Allocations Lifted

ALLOCATIONS of pig iron under the voluntary agreements program covering the manufacture of cast iron residential housing items have been discontinued. However, the voluntary plan, which by law does not expire until Sept. 30, will remain in effect to permit resumption of allocations should a change in supply conditions warrant such action.

The voluntary plan providing pig iron for residential housing items became effective in July, 1948, and made available approximately 100,000 tons of pig iron monthly for manufacture of critical housing items.

Another Step Into Business

THE CONTROVERSIAL steam plant at New Johnsonville, Tenn., to enable the Tennessee Valley Authority to meet power requirements when hydroelectirc generation sags, is in the clear. It is in the $524.7 million First Deficiency bill sent to President Truman for signature. The bill, as it came out of House-Senate conference, provides for $2.5 million to start work on the New Johnsonville plant.

Manufacturing Income Up

NET INCOME, after taxes, of all U. S. manufacturing corporations during 1948 is estimated at $11.5 billion by the Securities & Exchange Commission and the Federal Trade Commission. This represents a 14 per cent increase over the $10.1 billion of profits after taxes for 1947. The 1948 total was about equally distributed over the four quarters.

While profits after taxes in 1948 were 14 per cent higher than profits in 1947 there was a considerable variation in trends for the different industrial groups. In general, the producers' goods industries showed the increases in profits while the consumers' goods industries showed the declines.

Sales of all manufacturing corporations in 1948 aggregated $165.6 billion, about 10 per cent above total sales for the preceding year. Costs and expenses were estimated at $147.3 billion, approximately the same percentage increase. Provision for federal income taxes amounted to $6.9 billion. Dividends paid totaled about $4.3 billion, a 17 per cent increase over 1947.

How To Find New Products

MANUFACTURERS looking for new products to round out their lines and keep their employees and machinery busy may find help in a new U. S. Department of Commerce publication, "Developing and Selling New Products."

Prepared by Gustav E. Larson of the Marketing Division of the Office of Domestic Commerce, the publication is available for 25c from the Superintendent of Documents, U. S. Government Printing Office, Washington 25.

May Investigate Lobbying

CONGRESSIONAL investigation of lobbying activities this year is a strong possibility now that the House has adopted a resolution calling for such an investigation by a joint committee of the House and Senate. Whether the Senate agrees to such action or whether it will want to push the plan for an investigation by a subcommittee of the Senate Committee on the Judiciary remain to be seen. The House took its action following a discussion of the subject with the President so that the so-called real estate and housing lobby probably will be singled out for special attention. However, House leaders say that not only will private lobbyists be investigated, but also government officials who have sought to influence legislation.

The House lobby register now is composed of names of 1537 individuals and organizations; one of the charges to be looked into is that many lobbyists have not registered.

Who are the registered lobbyists? They are individuals, firms and associations representing almost every conceivable activity. Possibly the biggest increase has been in labor representation. Anyone desiring to study the register will find it in the *Congressional Record* for May 5. It occupies pages 5846—5907 inclusive, set in fine print.

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Empire Industry Booms

British Commonwealth nations' modernized techniques, expansions promise higher output

MODERNIZED techniques and long-term plant expansions hold promise of an even higher industrial production level in the British Commonwealth of Nations.

Materials handling equipment and labor-saving electrical apparatus took the spotlight at the British Industries Fair this month. Canadian steel companies see little letup in demand for their products, although the gap between supply and demand is now narrower following extensive expansions in steelmaking capacity. American and British engineering firms, engaged by India as consultants, recommend that the nation raise its steelmaking potential by at least 1 million tons annually. A new mill under construction in Australia will for the first time give that country a tin plate capacity of 120,000 tons annually. Although the Union of South Africa's metalworking production has risen steadily since the war, little further increase is expected before 1950 when South African Iron & Steel Industrial Corp. Ltd.'s $100 million expansion program is completed.

Great Britain

MATERIALS handling equipment and other apparatus to raise production were the star attractions at the British Industries Fair attended by 16,740 trade buyers.

Producers of industrial motorized trucks had more equipment on display than last year, some of which boasted design innovations unfamiliar to the 700 American buyers on hand. Handling equipment for foundries was particularly emphasized, as were magnetic devices for separating scrap, ore and other materials at steel mills.

The largest piece of electrical equipment at the fair was a 275,000-volt oil circuit breaker which stands 23 feet high and weighs 10 tons. It will be used in the expanding British power distribution system.

Production and more production is still the order of the day. Although the steel industry may produce a record 17,360,000 net tons of ingots this year, an estimated 20,160,000 tons are needed. To make up the deficit, semifinished steel is imported from Belgium, Luxemburg, France and Australia. The record output of steel ingots has been possible through use of larger tonnages of scrap and pig iron reserves. Domestic pig production has fallen, partly because of lower ore imports. Only 100 blast furnaces are in operation, and output in the last four months has been below the 1948 average.

Iron & Steel Federation had this steel mill model as its exhibit at the British Industries Fair. The model, showing ore loading equipment and the blast furnaces, followed on the right by the steel furnaces and rolling mills in the distance, measures 60 feet by 24, on a scale of 6 feet to one inch. The exhibit was built in 40 sections

Canada

CONSENSUS among Canadian steel producers is that demand will remain unabated in all but a few specialty products for the remainder of the year, although supplies by the fourth quarter will nearly meet demand.

Ingot production in 1948 was about 10 per cent greater than in 1947, and another boost is expected in 1949. Dominion Steel & Coal Corp., Montreal, will bring into production this year additional capacity of about 70,000 tons. The company is also considering construction of an additional 100,000 tons per annum.

While exports to the U. S. thus far this year are well above the same months of 1948, imports are also rising, with the net result that the trade imbalance still exists and import restrictions on U. S. products must remain in force. Canada's domestic exports during the first 1949 quarter totaled $658.8 million, 2 per cent below the same period of 1948.

India

KOPPERS Co. Inc., Arthur McKee & Co. and International Construction Co. of England, consultants for India on the steel situation, agree that natural resources and demand are sufficient to justify the government in building a new steel plant and in supporting expansion of existing facilities to boost the nation's production capacity of 1,128,000 tons by at least 1 million annually.

Recommendations include construction of a $187 million steel plant in central India with a capacity of 500,000 to 600,000 tons annually and government support of the following expansions of existing capacity: A $20,750,000 program to modernize the equipment of Tata Iron & Steel Co. Ltd.; a $20,250,000 project to add a skelp mill, Fretz-Moon tube and pipe mill and an alloy and tool steel plant to Tata's facilities; a $57.8 million program to increase Steel Corp. of Bengal's capacity by 420,000 tons a year; and a plan to more than quadruple Mysore Iron & Steel Works' capacity to 100,000 tons annually. The consultants estimate the future capacity of India's secondary producers and rerollers at about 600,000 tons.

Australia

COAL and labor shortages are the hurdles in Australia's metalworking production race, accounting for a 15 to 20 per cent decline in steel output during the first quarter of the year.

More efficient coal preparation plants and maximum labor-saving mechanization promise to help solve these problems, and industry expansion is progressing. Major projects include Australian Iron & Steel Ltd.'s new mill to produce 120,000 tons of tin plate annually, the first such mill on the continent; an aluminum fa-

cility at Bell Bay, Tasmania, which eventually will produce 25,000 tons a year; and expansion of Austral Bronze Co.'s plant at Hobart, Tasmania, to double its output.

Union of South Africa

COMBINED production of South African Iron & Steel Industrial Corp. Ltd., Union Steel Corp. Ltd. and African Metals Corp. Ltd. during 1948 totaled 658,065 net tons of ingots, 705,013 tons of pig iron and 12,740 tons of ferroalloys, a new record.

The first firm, known as Iscor, is a government-owned corporation established in 1928 and the major producer. When its $100 million expansion program is completed in 1950, the government expects to lift steel restrictions under which South Africa's metalworking industry operates. Total ingot capacity of all South African steel producers is expected to reach 1.1 million tons when all expansions are completed.

U. S. Gets Critical Materials

ANOTHER DEAL with the United Kingdom to benefit our stockpile of critical and strategic materials has been completed by the Economic Recovery Administration. It involves platinum, sisal and sperm oil, bought for 640,000 pounds sterling taken from counterpart funds set up by the United Kingdom to match United States dollar grants under the European Recovery Program.

Coke Export Quota Raised

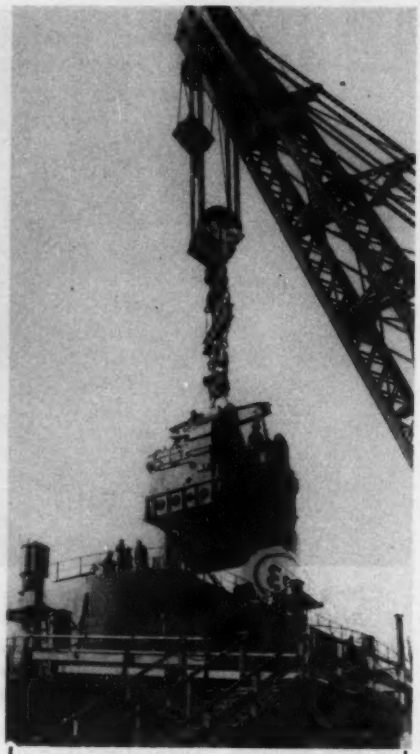
THIRD QUARTER export quota for metallurgical grades of coke has been set at 50,000 tons, an increase of 30,000 tons over quota for the second quarter.

License applications for third quarter shipments of such coke may be filed with the Office of International Trade, Washington, any time during the quarter. Coke other than metallurgical grades is not under quantitative export quotas and applications for licenses may be filed at any time.

Export Restrictions Eased

EXPORT QUOTA restrictions have been removed from 21 iron and steel mill products.

As a result of this action, the third of its kind in slightly more than a month's time, only the following iron and steel mill products will remain under export quota provisions at the beginning of the third quarter: Galvanized steel sheets; electrical sheets, transformer grade; iron and steel scrap; and tin and terne plate.



HARNESS: This double-reduction gear unit will harness the driving power of a new tanker's 12,500-hp propulsion unit by translating the thousands of revolutions per minute of the turbines into a usable 112 rpm for the propellers. Unit, built by General Electric, is shown being swung aboard tanker being constructed for Standard Oil Co. (New Jersey) at the Newport News Shipbuilding & Drydock Co. yards

Aluminum Export Quota Set

EXPORT QUOTA for aluminum sheet, plate and strip for the third quarter will be the same as that for the second quarter, 15,000 short tons. License applications under this quota may be filed with the Office of International Trade, Washington, until June 10.

ECA Allocates $5 Billion

PROCUREMENT authorizations granted all European countries under the Marshall Plan from its beginning on Apr. 3, 1948, to May 1, 1949, totaled $5,070,200,000.

This sum, the Economic Cooperation Administration said, is comprised of: Food and agricultural commodities, $2,856,100,000; industrial commodities, $2,287,800,000; technical services, $4,000,000; promotion and development of travel $100,000; revolving fund, $2,500,000; and ocean freight, $419,700,000.

CALENDAR OF MEETINGS

May 30-June 1, Metal Treating Institute: Spring meeting, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 420 Lexington Ave., New York.

May 30-June 10, Canadian International Trade Fair: Toronto, Ont., sponsored by the Canadian government.

June 1, Water & Sewage Works Manufacturers Association Inc.: Annual meeting, Stevens Hotel, Chicago. Association headquarters are at 170 Broadway, New York.

June 1-3, Material Handling Institute: Meeting, Asheville, N. C. Institute headquarters are at 1108 Clark Bldg., Pittsburgh.

June 2-4, Electric Metal Makers Guild: 17th annual meeting, Bismark Hotel, Chicago. Guild secretary-treasurer is D. L. Clark, 39 Grasmere Rd., Lockport, N. Y.

June 5-10, Society of Automotive Engineers: Summer meeting, French Lick Springs Hotel, French Lick, Ind. Society headquarters are at 20 W. 39th St. New York.

June 6-8, American Gear Manufacturers Association: 33rd annual meeting, The Homestead, Hot Springs, Va. Association headquarters are in the Empire Bldg., Pittsburgh.

June 8-9, American Management Association: National conference on key management issues, at the Waldorf-Astoria Hotel, New York. Association headquarters are at 330 W. 42nd St., New York.

June 9-10, American Coal Sales Association: Annual convention, the Greenbrier, White Sulphur Springs, W. Va. Association headquarters are in the Washington Bldg., Washington, D. C.

June 9-10, Steel Founders' Society of America: Industrial relations meeting, Drake Hotel, Chicago. Society headquarters are in the Midland Bldg., Cleveland.

June 13-14, Stoker Manufacturers' Association: Annual meeting, French Lick Springs, Ind. Association headquarters are at 307 N. Michigan Ave., Chicago.

June 13-15, Material Handling Institute: Great Lakes materials handling conference, Doermann Theater, University of Toledo, Toledo, O. Institute headquarters are at 1108 Clark Bldg., Pittsburgh.

June 13-15, American Society of Mechanical Engineers: 15th national applied mechanics conference, Ann Arbor, Mich. Society headquarters are at 29 W. 39th St., New York.

June 16-17, Malleable Founders' Society: Annual meeting, The Homestead, Hot Springs, Va. Society headquarters are at 1800 Union Commerce Bldg., Cleveland.

June 20-22, National Association of Purchasing Agents: 34th convention and show, Hotel Stevens, Chicago. Association headquarters are at 11 Park Place, New York.

June 20-23, American Society of Agricultural Engineers: Annual meeting, East Lansing, Mich. Society address is Box 229, St. Joseph, Mich.

June 20-24, American Standards Association: Seminar on standardization at association headquarters, 29 W. 39th St., New York.

June 20-24, American Society for Engineering Education: Annual meeting, Rensselaer Polytechnic Institute, Troy, N. Y.

June 24, Porcelain Enamel Institute: Third annual sales management conference, Carter Hotel, Cleveland.

June 27-28, American Foundrymen's Society: Chapter chairmen's conference, Chicago. Society headquarters are at 222 W. Adams St., Chicago.

June 27-30, American Electroplaters' Society: National convention, Hotel Schroeder, Milwaukee. Society headquarters are at 473 York Rd., Jenkintown, Pa.

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New Industry Emerging from the Smog

Makers of electrostatic air cleaners see vast sales possibilities ahead; compare their situation to that of mechanical refrigerator producers 20 years ago

THE RELATIVELY new industry producing electrostatic precipitators for air pollution control hopes to make hay where the sun won't shine.

More stringent municipal laws (STEEL, Feb. 28, p. 51), union pressure from organizations like the Textile Workers and general public opinion are forcing more attention and action on the problem of contaminated air.

New Industry—Makers of electrostatic air cleaners, such as E. W. Meyers Jr., president of Trion Inc., McKees Rocks, Pa., believe that the industry is on the threshold of a new era in industrial, commercial and domestic fields just as the mechanical refrigeration industry tapped on the door of vast markets about 20 years ago. Members of the industry include Koppers Co. Inc., Pittsburgh; Research Corp., New York; Western Precipitators Inc., Los Angeles; Westinghouse Electric Corp., Pittsburgh; Raytheon Mfg. Co., Waltham, Mass.; American Air Filter Co., Louisville, Ky.; and Trion.

Raytheon estimates that the potential in commercial and domestic air cleaning is $25 million yearly. The company's order backlog is 20 per cent greater than last year. Koppers Research and Western, the only firms exclusively devoted to industrial electrostatic equipment manufacture, have an estimated annual business volume of $2 million each. Before Koppers began its operations in this field just after World War II, it already had an order backlog of $2.5 million. Westinghouse believes that its 1949 percipitator sales volume will double that of 1948. The industry has entered this postwar expansion phase so recently that all but Koppers and Westinghouse subcontract much of their work.

Invented 40 Years Ago—The first precipitator was invented about 1909 by Dr. F. G. Cottrell when he was retained by a cement company to solve its air pollution problems. He licensed Research Corp. and Western Precipitators to make the device under the patents he held. These two firms confined themselves largely to special industrial projects because the Cottrell equipment generated a corona discharge or ozone which made the air unfit to breathe.

In 1938 Westinghouse took out patents on a device developed by Dr. Gaylord W. Penney to control the ozone. Just before World War II Westinghouse launched the Precipitron, its name for the precipitator, using the Penney refinements on the original Cottrell device, on which patents had expired by that time. The war forced curtailment of merchandising plans, but today Westinghouse is back in the field and has also licensed American Air Filter, Raytheon and Trion to use its patents to make air cleaners for domestic and commercial purposes. Trion has also entered the industrial phase where control of ozone is not as important as in domestic and commercial applications. Trion estimates its business is 40 per cent commercial, 40 per cent industrial and 20 per cent domestic.

Costs Vary — A completely installed electrostatic air cleaner in a home which has forced warm air heat costs $600. Costs in industry and commerce vary widely. One corporation, for example, estimates that the expense would be $190 million and 30 years' time to install this apparatus in its Pittsburgh area plants. More and more new facilities are now being created with electrostatic air control equipment built in or the space allowed for it to be installed eventually. Major problem encountered with old plants is insufficient space in which to put the control apparatus.

The air precipitator does its cleaning much as a magnet sucks up iron filings. The soiled air is passed through an electrostatic field, where electric charges are imparted to the dust particles. These particles are then attracted to electrically charged plates of opposite polarity and the cleaned air passed to wherever is desired. At intervals the accumulated residue must be removed from the plates. In some instances residues have commercial value. In Germany during the war precipitators were installed on bessemer furnaces, and they recovered 15 per cent of the iron oxide going into the air. Manufacturers cite U. S. Bureau of Standards tests which show that the electronic cleaner takes 85 to 90 per cent of the dust out of the air. It also sifts out soot, oil mist, bacteria, pollen, mold spores and smoke.

Pittsburgh Steel Fights Smoke

PITTSBURGH Steel Co. has launched a three-way program to combat smoke and dirt at its Monessen, Pa., plant.

Major causes of air pollution have been the coke ovens, blast furnace "slips," and company steam locomotives. In regard to coke ovens, Pittsburgh Steel has undertaken a program of extensive alterations to the battery doors with the object of reducing smoke seepage and leakage to the minimum. In the matter of blast furnace "slips" which discharge huge quantities of smoke and ore dust into the air as the result of operational difficulties, the company is studying the problem and has already inaugurated new practices that have curtailed the trouble. Seven of the company's steam locomotives have been replaced with diesels, and eventually all the coal-fired units will be discarded.

SMOKE SLEEVE CUTS AIR POLLUTION AT COKE OVENS

TO BRING under control one of the worst polluters of air, industry has something up its sleeve—a smoke sleeve to capture smoke that arises from the charging of by-product coke ovens.

When an oven is being charged or filled with coal, dense, black smoke rolls upward as the coal strikes the torrid atmosphere of the oven. The smoke sleeve devised to capture this smoke is a portable hood that is placed over the oven during the charging process. The captured smoke is funneled into a nearby oven where coking of a charge of coal has been completed but from which the coke has not yet been pushed. There the carbon content of the smoke is dissipated and resultant gas goes into gas mains.

The smoke sleeve is attached to the coal charging car atop the coke ovens and thus by being portable serves an entire battery of ovens.

Such a smoke sleeve has been installed on coke ovens at the Aliquippa, Pa., works of Jones & Laughlin Steel Corp. and one is to be installed soon at the Cleveland coke ovens of Republic Steel Corp. Maker of the smoke sleeve is Koppers Co. Inc., Pittsburgh.

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Unit of National Steel Corporation

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Borg-Warner to start tooling for production of new torque-converter automatic transmissions for Studebaker. Program stimulates machine tool trade

DETROIT

ANNOUNCEMENT by Borg-Warner Corp. that it would begin immediately a large program of tooling and equipment for production of a torque-converter type of automatic transmission to be used in Studebaker passenger cars was good news to the faltering machine tool trade and at the same time heightened the competitive picture on transmissions generally. Production is slated to be under way late this year at Borg-Warner's Detroit Gear Division, with some of B-W's other divisions probably supplying certain components.

Recalling that Packard spent about $7 million to set up its automatic transmission department on a projected 40 per hour basis, it is apparent some major investments in tooling will be required for the Studebaker project, since passenger car production at the South Bend plant is running more than 1000 units daily and the experience of other producers has been that a large percentage of buyers will specify automatic transmission if it is available. The first year Pontiac offered Hydra-matic, for example, nearly three out of every four buyers wanted it.

Used Stamped Parts—Engineering details of the Studebaker transmission have not been revealed, although various trade reports indicate it includes a torque converter built up of stamped and formed flat-rolled steel sections locked and welded together, plus two planetary gear sets and some means for "clutching out" the converter at cruising speeds. A converter assembled from steel elements is calculated to be considerably less costly than the intricate sand cast aluminum designs currently used in Buick and Packard transmissions. The latter company experimented extensively with a steel design, brazed together, but concluded the necessary brazing furnace would be far too bulky and costly, since extremely slow cooling is necessary to avoid distortion of vanes once they have been positioned in the housings. The vanes also are of a curved shape and the section tapers to the outside, complicating the fabricating problem.

Should the Borg-Warner design prove satisfactory and trouble-free—and the long tests it has been through would seem to leave little doubt on this score—it might ultimately find its way onto other cars with resultant lowering of unit production costs for all. One of the big objections to these transmissions now is the $200 extra cost assessed to the owner and with price coming to be more of a deciding factor in automobile purchases many are becoming inclined to the view that, "I can shift a lot of gears for $200."

Lincoln To Offer Hydra-matic—Next month Lincoln is supposed to be offering the Hydra-matic transmission as optional equipment. Meanwhile, Kaiser-Frazer has been putting some test cars equipped with Hydra-matic through their paces, and Nash is contemplating making the device available as extra equipment on its Ambassador models. Borg-Warner, independent as it is of any automobile manufacturing company, would appear to be in best position to cash in on automatic transmissions if it can furnish them in sufficient quantity. Car builders outside the GM family would much prefer a Borg-Warner product to one supplied by a competitor.

For its part, General Motors is readying a new torque-converter job for Chevrolet on its 1950 models and is busily engaged on improvements in both the Buick Dynaflow and the Hydra-matic. Slippage resulting in lowered gasoline economy and bothersome heat have appeared as objections to the Dynaflow, while inflexibility seems to be about the only grudge against the Hydra-matic. Consensus around Detroit is that eventually transmissions will standardize around the torque converter with means for disengaging it at cruising speeds — something like Packard now has.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	563,300*	462,323
May		359,996
June		454,401
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
May 7	130,113	84,684
May 14	119,634	83,275
May 21	114,987	91,138
May 28	116,000	92,772

Estimated by Ward's Automotive Reports

GM To Broaden Fluid Sales

A PROPOSAL for encouraging direct sale of automatic transmission fluids through oil company filling stations has been outlined by General Motors. Objectives of the plan are sevenfold: 1. To broaden the marketing of fluids through petroleum company service station outlets instead of through dealers' service departments, 2. to standardize a fluid for both Hydra-matic transmissions, 3. to establish test procedures with a neutral research laboratory to certify fluids submitted for test, 4. to check sample fluids further with severe road tests on the GM proving ground, 5. to fix identification codes which motorists can recognize easily at filling stations, 6. to enable motorists to avoid improper or inferior products which may be offered by marketers or jobbers who do not appreciate the exacting requirements involved, and 7. to provide car owners an improved fluid in the future, better than the ones now specified, as a result of research on the overall project.

These fluids have to function as a hydraulic power transmission medium, a hydraulic control fluid, a heat transfer medium, a clutch fluid and a gear and bearing lubricant. Research showed that without specified fluids, oxidation occurred at relatively low mileage and resulting varnish in transmissions gummed the control mechanisms.

GM To Specify Requirements—The corporation has sketched de-

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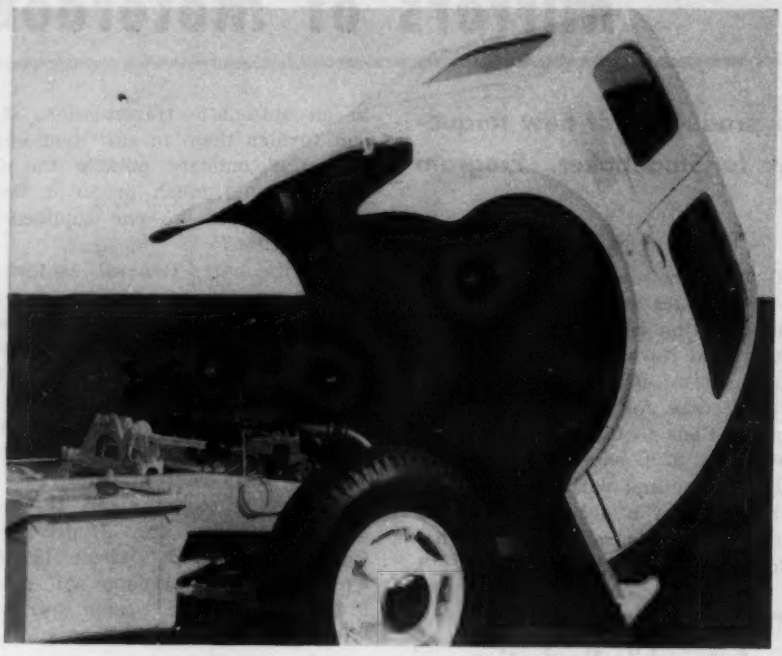

TILTING CAB: Power-lift cab provides quick and full accessibility to mechanical parts in the new White 3000 motor truck. A turn of a key lifts the cab under power through a wide arc, tilting forward, in less than 30 seconds. The actuating mechanism is a rugged adaptation of the device used on new transport planes to operate the landing gear

tails of how its proposed program would work in a bulletin just issued to petroleum refiners and marketers. Briefly they are as follows: 1. Petroleum companies can obtain from H. R. Wolf, assistant to the technical director of GM research laboratories, detailed requirements to which their product must conform; 2. proposed fluids will be submitted to the Armour Research Foundation, a neutral laboratory at Chicago, to determine whether they meet GM specifications; 3. following satisfactory completion of tests at Armour, the fluids will undergo performance tests at the GM proving ground; 4. these tests completed, data will be reviewed by the GM technical committee; 5. if the product is accepted, the oil refiner or marketer will be issued an "Armour qualification number," which will apply only to a fluid of identical composition and performance characteristics as the one formula tested; 6, all automatic transmission fluids marketed by petroleum companies will be identified by this AQN embossed on the lids of all single and 5-quart containers, or comparable size sealed containers. The same number will be stenciled on all larger containers, pails or drums.

Use Own Trade Names—Each oil company will use its own trade name, of course, and in addition the general term, "'automatic transmission fluid, type A," the "A" signifying it is for passenger cars. Subsequent types may be coded for trucks, busses, and coaches.

GM Reduces Prices, Wages

PRICE reductions in General Motors passenger cars and trucks and Frigidaire appliances were not unexpected in view of similar action taken three months ago coincident with the 2-cent hourly reduction in wages. This time, however, wages went down only 1 cent, since the BLS consumer price index dropped only 1.2 points between Jan. 15 and April 15, standing at 169.7 for the latter date. Actually, GM employees receive a net gain of 2 cents an hour, effective June 1, because a 3-cent hourly "annual improvement factor" becomes operative on that date. Salaried employees will receive commensurate adjustments. Next review of the price index and wage changes will occur at the end of August, with the index figure for July 15 being the determining factor. Prospects point to a further decline.

New Truck Line Introduced

A NEW "H" line of heavy - duty trucks, including 61 basic gasoline and diesel models, with gross vehicle weights ranging from 19,000 to 75,000 pounds, will be rolling from assembly lines of the GMC Truck & Coach Division during June. Featured are more powerful engines, stronger chassis and roomier cabs, along with heavy-duty grilles which include an in-built spring steel bumper guard, at top and sides, for radiator and front-end protection. Channel-type front bumpers are heavier, deeper, wider and stronger. Fenders are of heavy-gage steel, solidly mounted and easily removed to permit better engine accessibility for service.

Engines include five new gasoline types, with compression ratio increased from 6 to 1 to 6.5 to 1. Two diesels, with 135 and 200 horsepower respectively, have compression ratios boosted to 17 to 1; a new 300-horsepower design is now in the test stage.

Kaiser Finds Going Tough

THE FIRST three months of 1949 were rough ones financialwise for Kaiser-Frazer involving as they did a $4.1 million rebate to dealers after substantial price reductions made it necessary to reimburse them for the 15,000 cars in field stocks. In all, K-F lost $5.8 million, or $1.27 per share, according to reports presented at the company's annual meeting in Reno, Nev., recently. The three-week shutdown during February and March for inventory adjustments and tooling-up for the new Traveler model also was costly, although the outlook has improved in the second quarter with sales running 2½ times the weekly average for January-March.

Tucker Material Sold

MATERIALS and equipment of Tucker Corp. were scheduled to be sold at auction last Thursday. On the list were 1500 tons of steel sheets, plates, strip, bars and structurals, 4100 pounds of sheet aluminum, 6000 pounds of copper, brass and bronze, 11,000 yards of automobile carpeting etc. Although the trustees in reorganization were talking of hiring management engineers to attempt salvaging something more from the operation, it appeared the Tucker venture could be considered washed up.

Starter Drives Air Compressor

STARTER motor on automoblie engines is being used as a secondary source of power to drive air compressors which in turn supply power for devices such as window lifts, convertible top mechanisms, windshield wiper motors, auxiliary vacuum pumps and the like, by the Trico Products Corp., Buffalo. The company has completed tooling on a number of new units in this category, all functioning by compressed air.

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NOW . . . get Lok-Thred's greater strength . . more positive locking action . . in *any* size stud, bolt or screw

Are you making full use of LOK-THRED'S proved advantages—and its availability in any size or type of threaded fastener?

The revolutionary LOK-THRED design locks securely and becomes tighter in service . . . has much higher fatigue limits and is stronger in both tension and torsion than ordinary American National Threads...does not require selective fits.

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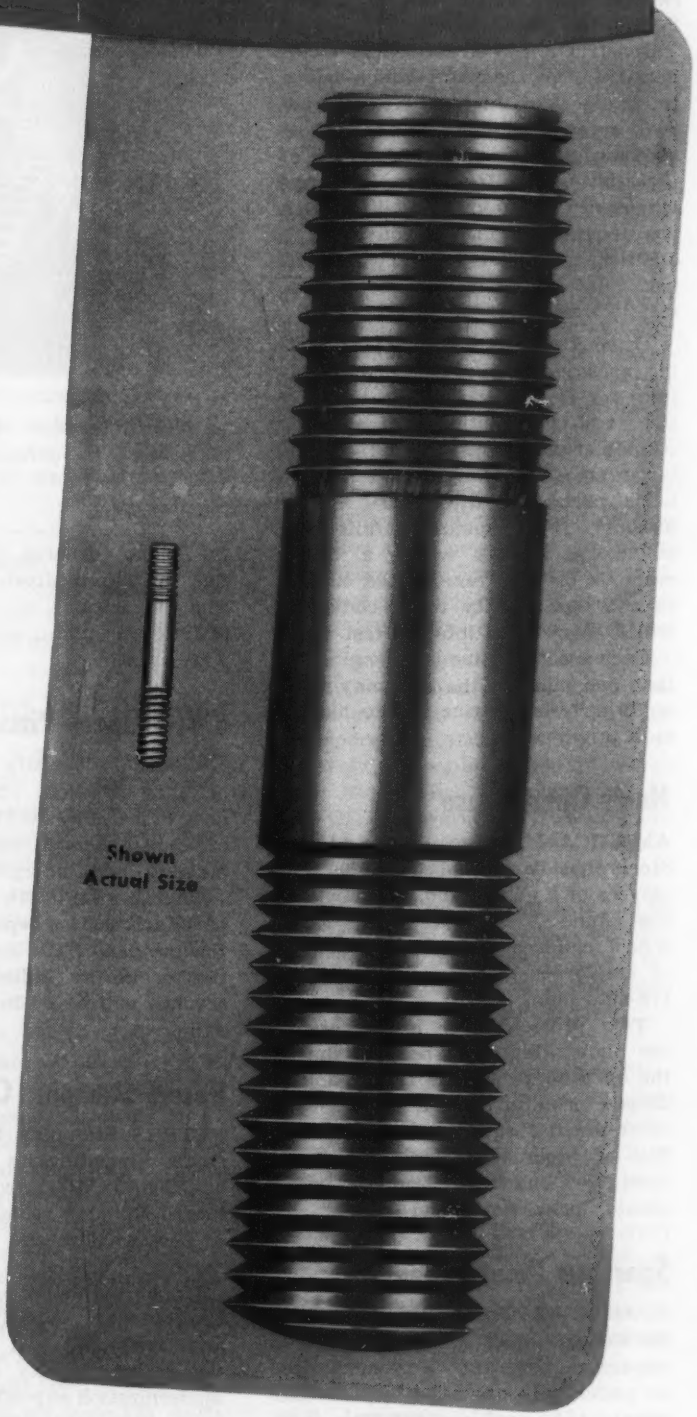
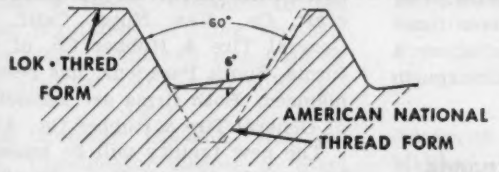


SEE THE DIFFERENCE!



Note Lok-Thred's larger cross section . . . and flat root surface instead of a relatively sharp "V" . . . as compared to the American National Thread form. Here's the secret of Lok-Thred's greater strength.

National
HEADED AND THREADED
PRODUCTS

THE NATIONAL SCREW & MFG. CO.
Cleveland 4, Ohio

Pacific Coast: National Screw & Mfg. Co. of Cal.
3423 So. Garfield Ave., Los Angeles 22, Cal.

Caterpillar Diesel Plant

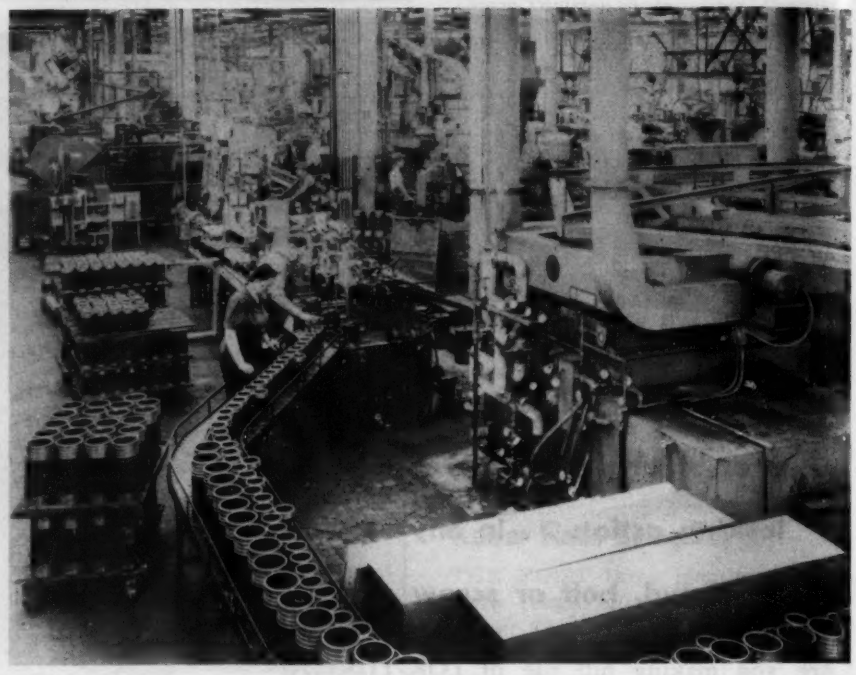
Covering 20.6 acres under roof at Peoria, Ill., now in production; was begun in 1946

CATERPILLAR Tractor Co. has begun full production of diesel engines for industrial power units, marine engines and electric sets at a new Peoria, Ill., plant.

Construction was started in October, 1946, on the plant which has a total one-floor area under roof of 20.6 acres, including 10.6 acres of machine shop area and 8.2 acres of assembly area. More than 1200 machines, are set up in the facility which has about four miles of conveyors in addition to 1400 cranes. Twenty-one test cells are each large enough to test two engines.

Three Assembly Lines—The assembly area consists of three assembly lines for basic engines, two for erection, testing, painting and shipping of industrial engines, a test room and large areas for the storage of finished parts. All three basic engine assembly lines, running parallel, end in the same bay where a bridge crane is used to remove the engines to a set of gravity roller conveyors which carry them into the test room.

Each assembly line is so engineered that one man on the line may work on 19 different engine models moving on a conveyor.



New Caterpillar diesel plant contains more than 1200 machines. Shown here in the foreground is a cylinder liner line. Units behind the "H" column are honing machines

Holds Open House

AMERICAN Bridge Co., a U. S. Steel subsidiary, and the 2500 employees of its Gary, Ind., plant will be host June 1 to more than 10,000 school children, families and friends of employees and the public at the 178-acre plant.

Two projects now in process in the plant which will be seen during the open house are the fabrication of diesel locomotive underframes and earth-moving equipment. The firm's line of products includes structural steel for buildings, bridges, power plants, locks, gates and dams.

Sparrows Point Expansion

SPARROWS Point, Md., plant of Bethlehem Steel Co. continues its expansion program. Now authorized or under way are a battery of coke ovens, additional ore handling facilities and increased facilities for coke gas distribution.

Last year the company completed at Sparrows Point a battery of coke ovens; a blast furnace; four soaking pits; high pressure waste heat boilers; installation of Dorr thickeners at the blast furnaces for removal of flue dust from fresh water; expansion of facilities for producing electrolytic tin plate; and a 60,000 kw power station.

Y & T Opens Pittsburgh Branch

YALE & Towne Mfg. Co.'s materials handling division, Philadelphia, was host to 600 May 20-21 at the opening of a new branch sales and service building in Pittsburgh.

This is the sixth regional spare parts and service depot established by the company. The first is now functioning in the Philadelphia area; a seventh will be opened in Chicago in June.

Peters Stamping Co. Expands

PETERS Stamping Co., Perrysburg, O., is expanding its plant at a cost of $200,000 to provide for an enlarged shipping room and installation of new welding and assembly equipment.

Upon completion of this program, the company's capacity for stampings and assemblies will be increased to twice the capacity early last year. Modernization expenditures since January, 1948, total about $500,000.

Seeks To Build Gas Pipeline

REQUEST for permission to construct a 72-mile pipeline in northern Ohio for transportation of 26 million cubic feet of natural gas daily for resale to utility companies has been filed with the Federal Power Commission, Washington, by Eugene H. Cole, Washington. He plans to incorporate and operate the Erie Gas Service Co. Inc.

The proposed project for serving an area east of Cleveland would cost an estimated $1,550,000. Gas requirements of the line would be supplied by Tennessee Gas Transmission Co.

General Tire Merges Coast Units

CONSOLIDATION of Marquardt Aircraft Co., Van Nuys, Calif., and General Tire & Rubber Co. of California, South Pasadena, has been announced. Both firms are subsidiaries of General Tire & Rubber Co., Akron.

The new facility will be known as Marquardt Aircraft Co., with all personnel and equipment consolidated in its 100,000-square foot Van Nuys plant. Marquardt has been engaged in the development and manufacture of ramjet and pulsejet aircraft engines, while General Tire's South Pasadena plant manufactured electronic and special ordnance equipment.

Consolidated Western Plant Bid

CONSOLIDATED Western Steel Corp. has offered to buy the U. S. Navy's installations and equipment at Orange, Tex., which were operated by Consolidated during the war as part of its wartime Orange shipyard.

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Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Black & Decker Mfg. Co., Towson, Md., maker of portable electric tools, reports its Indianapolis service station has moved to 1125 W. 16th St.

—o—

Package Machinery Co., Springfield, Mass., and **Frank D. Palmer Inc.,** Chicago, both manufacturers of package machinery, will merge, subject to ratification of stockholders. Palmer becomes a division of the other company.

—o—

Western Society of Engineers celebrated its 80th anniversary May 25 by dedicating new headquarters at 84 E. Randolph St., Chicago.

—o—

Central Territory Railroads Freight Traffic Committee, formerly known as Central Freight Association, has leased larger quarters in the State-Madison Bldg., Chicago.

—o—

Gas Appliance Manufacturers Association, New York, reports that 1,343,079 automatic gas water heaters, with a manufacturers' value of $67,662,000 were sold during the year ended February, 1949. Unfilled orders totaled 28,619 on Feb. 28.

—o—

Budd Co., Philadelphia, has completed a transaction with War Assets Administration to buy the Red Lion plant in Philadelphia for $5,250,000. Property owners adjacent to the facility have withdrawn their objection to a recent variance to the zoning regulation affecting the sale of the plant. Unit has been used by Budd since the war for car building.

—o—

Walsh Holyoke Division, Holyoke, Mass., Continental Copper & Steel Industries Inc., has been awarded a contract to construct a pipe line for the use of the Metropolitan District Commission of Massachusetts. About 1000 tons of steel will be required.

—o—

Lone Star Steel Co. set a new record in April by shipping 915 rail cars of products from its Lone Star, Tex., plant.

—o—

Carton Machinery Inc., producer of paper box machinery, has moved from 912 W. Pratt St. to larger quarters at 1619 S. Eutaw St., Baltimore.

—o—

Apex Electrical Mfg. Co., Cleveland, is transferring production of its automatic dishwasher from the Jackson, Mich., plant to Cleveland. Apex has tooling underway for a new combination sink and dishwasher unit to be in production in Cleveland within several months.

—o—

Council of Profit Sharing Industries reports a transcript of its first annual conference held in Chicago last November is now on sale. Council address is First National Tower, Akron.

—o—

War Assets Administration has transferred a surplus plant bordered by West Jefferson, Scotten and Clark avenues, Detroit, to the Public Buildings Administration where it becomes a part of the national industrial reserve. Facility during the war was used to manufacture automotive parts.

—o—

Alabama produced 571,778 tons of coal in the first four months of this year. Output for the same period last year was 395,077 tons.

—o—

Manhattan Rubber Division, Passaic, N. J., Raybestos-Manhattan Inc., recently honored 600 employees who have been with the company 25 years or more. One employee, a salesman at the New York branch, has 55 years of continuous service.

—o—

Dow Chemical Co., Midland, Mich., has moved its Industrial Applications Laboratory to new and larger quarters in Bay City, Mich.

—o—

American Furnace & Foundry Co., Midland, Mich., has purchased the Domestic Furnace Division of H. C. Williams Inc., Detroit, together with all manufacturing and sales rights to newly designed interchangeable gas and oil winter air conditioners.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, reports factory sales of standard-size household vacuum cleaners totaled 252,656 in April, down 18.4 per cent from March sales and 17.6 per cent off from the April, 1948, level. Industry sales in the first four months of this year totaled 1,032,896 units, nearly equal to the 1948 rate.

—o—

Whiting Corp., Harvey, Ill., has named George E. Miller Co., Boston; Grays Metal Works Inc., Philadelphia; and James J. Burke Co., Salt Lake City, Utah, as distributors of Tram-beam Overhead Crane and Monorail Systems in their respective city territories.

—o—

Cooper-Bessemer Corp., Mt. Vernon, O., announces development of a supercharged, 4-cycle gas engine, claimed to increase power output by 80 per cent while cutting fuel consumption by one-third.

—o—

Farrel-Birmingham Co. Inc., Ansonia, Conn., announces an association with C. A. Lapp & Co., Cleveland, which will handle the sale of Farrel gears and gear units in Cleveland.

—o—

H. H. Robertson Co., Ambridge, Pa., producer of protected metal for roofing and siding, reports its employees have received a second-time accident prevention award for keeping lost time accidents 65 per cent below the industry average. The first award was made in 1948.

—o—

Tin & Chemical Corp. is getting into operation at its new de-tinning plant, 19 Chesapeake Ave., Fairfield, Md. The new plant comprises 25,000 sq ft and will de-tin scrap tin plate.

—o—

U. S. Government Procurement Brochure, edited by experts in the various operations and workings of procurement, is available free of charge from the publisher, Trilane Associates-U. S. Government Procurement Service, 1 Hudson St., New York.

—o—

Ampco Metal Inc., Milwaukee, has issued a revised safety tool bulletin. Copies of this bulletin 119, which describes the full line of safety hand tools, are sent free upon request.

—o—

Westinghouse Electric Corp., Pittsburgh, is now designing a 110,000-kw, 3600-rpm, single-shaft, triple-exhaust, turbine generator for Union Electric Power Co., St. Louis.

—o—

L. O. Koven & Brother Inc., Jersey City, N. J., manufacturer of boilers, tanks, special process equipment and weldments, has added a metal spraying shop to its Jersey City plant facilities.

—o—

SKF Industries Inc., Philadelphia, maker of ball and roller bearings, will award $525 in prizes—including a first prize of $150—to 10 wage employees who submit the best essays in a contest from July 1 to Aug. 26 on "What 'Produce Better—Live Better' Means to Me."

The Business Trend

BUSINESS activity continues downward as STEEL's industrial production index fell to 165 per cent (preliminary) of the 1936-39 average, an eight-week low and only 3 points higher than the corresponding week last year.

STEEL—Steel production for ingots and castings slipped lower to 95 per cent of capacity in the week ended May 21, half a point below the 95.5 per cent in the preceding period which had been the lowest point thus far this year.

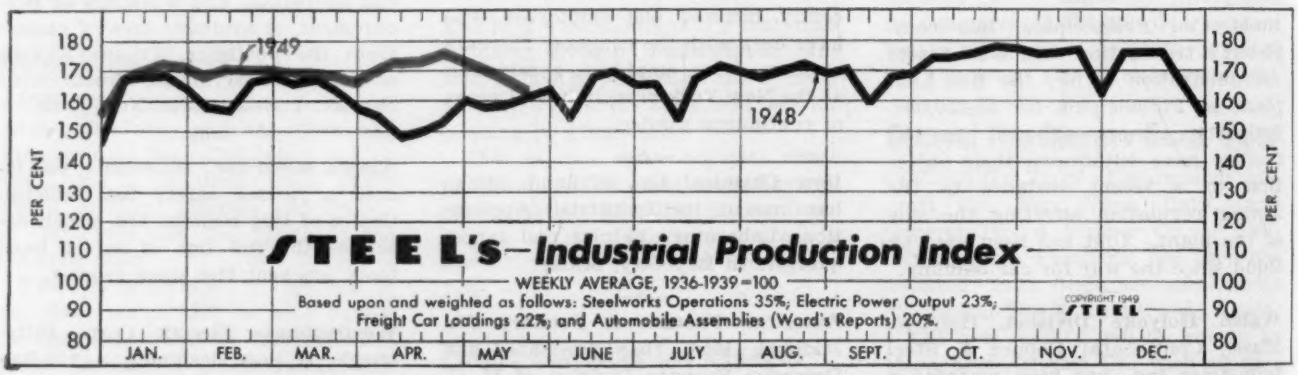
LABOR—Also contributing to the recession trend is the labor outlook. The Ford strike, the Bendix walkout and other automotive disturbances pulled total passenger car and truck assemblies in the week ended May 21 to 114,987 from 119,634 the preceding week, a drop for the fourth consecutive period. Labor strife looms ahead, notably in coal.

COAL—Bituminous coal production for the seven days ended May 14 is estimated at 11,040,000 net tons, compared with 11.2 million tons the preceding week and 13,248,000 tons for the corresponding 1948 period.

CARLOADINGS—The coal production drop is contributing to the decline in freight carloadings. Loading of revenue freight for the week ended May 14 totaled 771,736 cars, according to the Association of American Railroads. This is a decrease of 75,209 cars or 8.9 per cent from the corresponding 1948 period and a decline of 116,472 cars or 13.1 per cent from the corresponding seven days in 1947. Loading of revenue freight for the week of May 14 increased 0.4 per cent from the preceding week. Despite the declines, however, railroad operating revenues increased 1.3 per cent in April, because of higher freight rates, compared with same month in 1948. Freight revenue gained 2.3 per cent, but estimated passenger revenue dropped 2.8 per cent.

BUSINESS LOANS—Sagging alarmingly are business loans for commercial, industrial and agricultural purposes. Since reaching an all time peak of $15,632 million on December 22, the loans of weekly reporting member banks in leading cities dropped to $13,908 million on May 11. The consecutive decline covered 17 weeks, and the May 11 total was $441 million below a year earlier. Although a decline is usual in the first quarter, this year the drop amounted to $673 million, against only $220 million a year ago. Moreover, these business loans have shrunk nearly an additional billion since March 30. By May 12 of last year they had already begun their climb.

PRICES—Holding their own during the week ended May 17 were average primary market prices which advanced 0.1 per cent. The index was 156.0 per cent of the 1926 average, 0.6 per cent below four weeks ago and 4.8 per cent lower than the comparable period in 1948. Major reason for the advance was higher prices for livestock. Index for metals and metal products declined to 168.0 for the week, a drop of 0.1 per cent from the preceding period.



Index (chart above): Week ended May 21 (preliminary) 165 Previous Week 168 Month Ago 174 Year Ago 162

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.0	95.5	99.0	95.0
Electric Power Distributed (million kilowatt hours)	5,255	5,257	5,326	5,085
Bituminous Coal Production (daily av.—1000 tons)	1,840	1,868	1,908	2,206
Petroleum Production (daily av.—1000 bbl)	4,904	4,899	4,916	5,439
Construction Volume (ENR—Unit $1,000,000)	$157.8	$131.0	$107.3	$82.7
Automobile and Truck Output (Ward's—number units)	114,987	119,634	141,227	91,138

* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

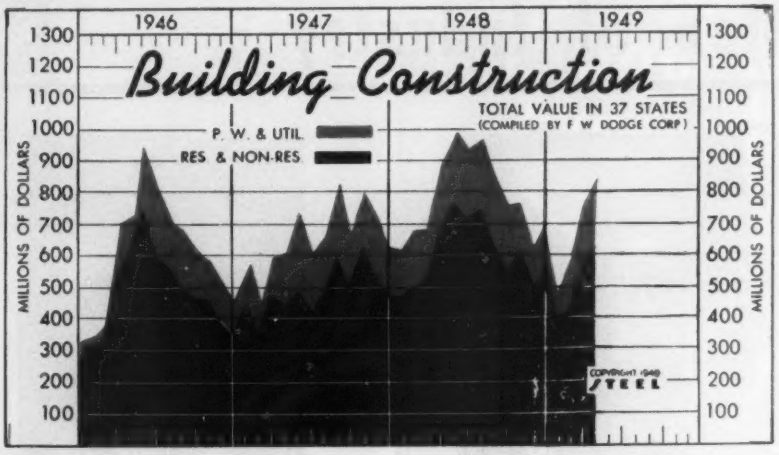
TRADE				
Freight Carloadings (unit—1000 cars)	770†	772	769	879
Business Failures (Dun & Bradstreet, number)	172	171	198	92
Money in Circulation (in millions of dollars)‡	$27,392	$27,452	$27,408	$27,690
Department Store Sales (changes from like wk. a yr. ago)‡	−3%	+1%	+7%	+8%

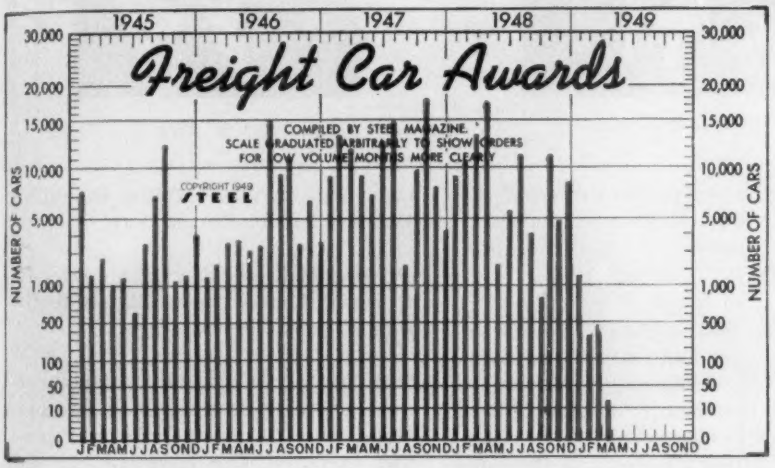
† Preliminary. ‡ Federal Reserve Board.

Construction Valuation in 37 States

(Unit—$1,000,000)

	Total	Public Works Utilities		Residential and Non-residential	
	1949	1949	1948	1949	1948
Jan.	483.0	102.0	136.6	381.0	478.6
Feb.	568.5	153.5	177.3	415.0	504.6
Mar.	747.6	168.4	164.3	579.2	525.5
Apr.	842.6	222.4	184.7	620.2	689.2
May	....	....	205.0	....	765.8
June	....	....	215.7	....	719.5
July	....	....	217.9	....	744.8
Aug.	....	....	207.8	....	646.3
Sept.	....	....	202.7	....	559.5
Oct.	....	....	165.5	....	613.1
Nov.	....	....	106.9	....	504.3
Dec.	....	....	170.9	....	523.1
Total	....	....	2,155.3	....	7,274.4




Freight Car Awards
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS
FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1949 STEEL
NUMBER OF CARS
1945
1946
1947
1948
1949
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Freight Car Awards

	†*1949	*1948	*1947	*1946	1945
Jan.	1,568	8,613	9,222	1,481	7,200
Feb.	332	10,698	13,724	2,328	1,750
Mar.	469	13,227	12,048	4,512	2,500
Apr.	30	17,215	9,186	3,564	1,120
May	....	2,228	7,389	2,900	1,526
June	....	5,368	12,784	3,335	670
July	....	11,308	14,840	14,836	3,500
Aug.	....	3,638	2,352	9,527	7,240
Sept.	....	738	9,917	11,102	12,840
Oct.	....	10,931	17,737	3,407	1,320
Nov.	....	4,852	8,079	7,190	1,650
Dec.	....	8,368	4,030	3,011	4,116
Total	....	97,184	121,308	67,193	45,432

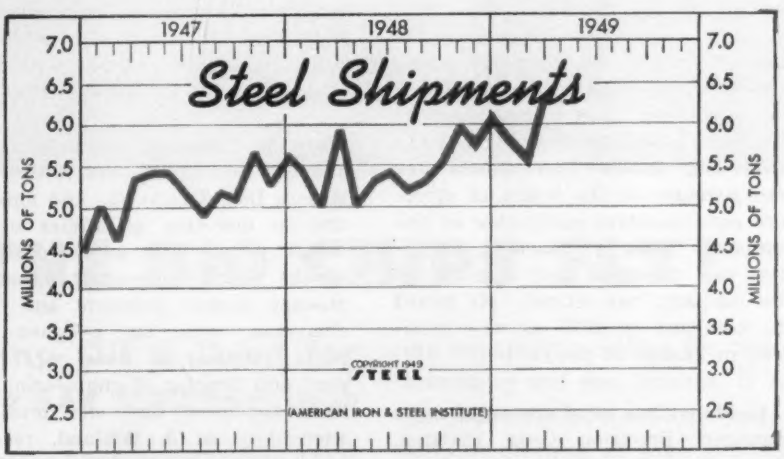
* American Railway Car Institute.

† Preliminary.

Steel Shipments

(Net Tons)

	1949	1948	1947
Jan.	5,778,632	5,410,438	5,061,333
Feb.	5,519,938	5,046,115	4,626,424
Mar.	6,305,681	5,978,551	5,304,415
Apr.	.....	5,096,161	5,445,993
May	.....	5,321,375	5,442,343
June	.....	5,476,774	5,263,711
July	.....	5,229,880	4,974,566
Aug.	.....	5,329,060	5,278,223
Sept.	.....	5,511,474	5,118,839
Oct.	.....	5,952,008	5,681,597
Nov.	.....	5,732,256	5,216,990
Dec.	.....	6,056,282	5,613,036



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,778	$12,273	$13,126	$14,731
Federal Gross Debt (billions)	$251.7	$251.6	$251.4	$252.2
Bond Volume, NYSE (millions)	$15.6	$15.0	$18.8	$28.7
Stocks Sales, NYSE (thousands)	4,361	4,052	5,228	13,372
Loans and Investments (billions)†	$62.0	$61.6	$61.1	$63.2
United States Gov't. Obligations Held (millions)†	$34,111	$33,263	$32,767	$35,499

† Member banks, Federal Reserve System.

PRICES

STEEL's Composite Finished Steel Price Average	$93.55	$93.55	$94.45	$80.27
STEEL's Nonferrous Metal Composite‡	183.0	184.4	194.4	196.6
All Commodities†	156.0	155.9	156.9	163.8
Metals and Metal Products†	168.0	168.1	171.5	157.1

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

Men of Industry

FRANK V. CARROLL

ARTHUR P. HALL

TOM W. RYAN

Frank V. Carroll has been appointed consulting engineer of Inland Steel Co., Chicago. He will be in the company's Chicago offices, moving up from his position of chief engineer of the firm's Indiana Harbor Works, which position he has held since 1927. **Fred H. Johnson,** formerly assistant chief engineer of Carnegie-Illinois Steel Corp., Pittsburgh, has been appointed to succeed Mr. Carroll at the Indiana Harbor Works.

—o—

James T. Duffy Jr., formerly president, Read Machinery Co. Inc., York, Pa., has been elected president of Riverside Metal Co., Riverside, N. J., succeeding **Lewis Van Dusen Jr.,** who remains on the board of directors and executive committee of the company. **John F. Hackett,** executive vice president and director of the company, has retired. He joined the company in 1919 as vice president in charge of production.

—o—

I. C. Maust has been appointed sales manager, Precision Gear Division, Foote Bros. Gear & Machine Corp., Chicago. He joined the company in 1946 after several years in the procurement department of Lockheed Aircraft Corp. At Foote Bros. he held the position of sales administrator.

—o—

Charles A. Fitz-Gerald, veteran Southern pig iron salesman, has resumed active representation in the St. Louis and Chicago territories for Sloss-Sheffield Steel & Iron Co., Birmingham.

—o—

Elisha Gray has been elected president, Nineteen Hundred Corp., St. Joseph, Mich., succeeding **Louis C. Upton,** who becomes chairman of the board. **Leonard R. Cooper** was elected vice president in charge of procurement.

—o—

Arthur P. Hall, assistant director of public relations and advertising, Aluminum Co. of America, Pittsburgh, has been promoted to director of that department, succeeding **C. C. Carr,** who is retiring after serving the company for 15 years in that executive capacity. Mr. Carr will become a public relations consultant, with headquarters in St. Petersburg, Fla.

—o—

Ward M. Canaday, chairman of the finance committee, Willys-Overland Motors Inc., Toledo, O., and long active in direction of affairs of the company, has been named chairman of the board, succeeding **James D. Mooney,** former president and board chairman, who has resigned both posts. **Delmar G. Roos,** vice president and director of engineering, has been appointed first vice president, succeeding **A. J. Wieland,** recently resigned as executive vice president. **C. E. Sorenson,** board vice chairman, has been placed on the executive committee.

—o—

Frank J. Wood has been appointed chief plant engineer, Fabricating Division, Permanente Metals Corp., Oakland, Calif.

—o—

Wheeling Steel Corp., Wheeling, W. Va., announces appointment of **John J. Maschenic** as manager of export sales, which are conducted through its office in New York.

—o—

Anthony Stormzand has been named resident manager of the new stamping plant in West Mifflin Borough, Pa., for General Motors Corp.

—o—

Dr. Max Hansen will join the Armour Research Foundation of Illinois Institute of Technology, Chicago.

—o—

Tom W. Ryan has been appointed manager of operations, Basic Refractories Inc., Cleveland. He is a former executive vice president and director of St. Johns River Shipbuilding Co., and previous to that was with Thompson-Starrett Co., where he was vice president.

—o—

Calvin A. Campbell, Donald Williams and **Ralph M. Hunter,** officers of Dow Chemical Co., Midland, Mich., have been elected directors of its subsidiary, Dow Chemical Co. of Canada Ltd. Mr. Williams, director of sales of the parent company, was made a vice president of the new Canadian company, and Mr. Campbell, secretary and general counsel of the parent organization, was elected secretary.

—o—

F. O. Dutton has been appointed director of purchases of E. W. Bliss Co., Toledo, O. He formerly was director of purchases, Easy Washing Machine Co. at Syracuse, N. Y.

—o—

Charles J. Philage has been appointed acting manager of the advertising department, and **Edward J. Sakal,** acting manager of accessory sales in the Heating Division of National Radiator Co., Johnstown, Pa.

—o—

Westinghouse Electric Corp., Pittsburgh, announces the following appointments in its Atomic Power Division: **Neil D. Cole** has been ap-

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Sunoco Emulsifying Cutting Oil Is Used for Rough-Finishing of Heavy SAE 3140 Forgings

The correct cutting fluid is a big factor in the continuous heavy-duty machining of tough steel forgings on the machine shown above.

Machine: Warner & Swasey 4-A Heavy-Duty Turret Lathe

Material: SAE 3140 Forging

Operation: Roughing-Out Cap for Pile-Driving Machine

Cutting Fluid: 1 part Sunoco Emulsifying Cutting Oil to 20 parts water

Sunoco Emulsifying Cutting Oil is a viscous, self-emulsifying oil that quickly and easily forms a stable emulsion with water. It contains no animal or vegetable fats, and will not turn rancid.

Sunoco Emulsifying Cutting Oil meets the demand not only of tough cutting jobs, but also of a wide range of turning, milling and grinding operations calling for close tolerances and fine finishes. It is particularly efficient where precision machining at high cutting speeds is demanded.

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pointed contract supervisor, **Charles J. Gerhart,** security officer, **C. H. Doran,** supervisor of receiving store and shipping, and **Charles F. Stewart,** supervisor of industrial relations. **Dr. W. E. Shoupp,** director of research for the division, announces appointments to the research staff as follows: **Dr. Sidney Siegel,** appointed manager of physics research, **Dr. W. A. Johnson,** manager of materials and metallurgy research, **M. A. Schultz,** named manager of instrumentation and control research, and **E. C. Barnes,** manager of industrial hygiene.

—o—

General Electric Co., Schenectady, N. Y., announces the following appointments: **James H. Goss,** appointed manager of engineering, Control Divisions of the apparatus department; **Steven C. Van Voorhis,** manager of advertising and sales promotion for the newly formed Michigan district, apparatus department; **Joseph P. Coughlin,** assistant manager, Specialty Transformer Sales Division, Specialty Transformer & Ballast Divisions; **T. F. Perkinson,** manager, Transportation Engineering Division, apparatus department.

—o—

Edward G. Brierty has been appointed equipment sales representative for the Radio Division of Sylvania Electric Products Inc., operating out of the Chicago office. He was formerly associated with Motorola Inc. as assistant buyer of electronic components.

—o—

Leetate Smith has been appointed general sales manager, Palmer Mfg. Corp., Phoenix, Ariz.

—o—

Samuel Wit, sales engineer with Lukenweld, machinery-making division of Lukens Steel Co., Coatesville, Pa., has been named district manager of sales of Lukens Chicago office. **J. H. Faunce Jr.,** manager of the Chicago office, will assume other duties in July, when Mr. Wit takes over his work in the Chicago office.

—o—

Gaylord L. Jones Jr. has been appointed sales representative for Osborn Mfg. Co., Cleveland, succeeding his late father in serving the southeastern area for the company's Brush Division.

—o—

E. E. Branson, warehouse supervisor at Columbus, O., for Oil Well Supply Co., United States Steel Corp. subsidiary, has been transferred to Charleston, W. Va., as assistant district material supervisor of the Ohio-West Virginia district. He is succeeded by **F. B. Lane** at Columbus.

—o—

V. E. Lawford has been appointed sales representative in the northern California territory for Buckeye Tools Corp., Dayton, O. Operating from headquarters in Oakland, Calif., Mr. Lawford will service the area between Bakersfield and the Oregon state line, with the exception of a few counties in the northeast corner of the state.

—o—

G. A. Lorz has been named superintendent of operations at the Garrison plant on Pittsburgh's south side for Mackintosh-Hemphill Co., and **C. R. Hodgson** has been named superintendent of operations at the company's plant at Midland, Pa.

—o—

Albert H. Clem has been appointed assistant manager of sales, Special Chemicals Division, Pennsylvania Salt Mfg. Co., Philadelphia, and **Richard A. Weppner** was appointed to the sales staff.

—o—

Burke B. Roche has been elected president, Binks Mfg. Co., Chicago, succeeding his father, **J. F. Roche,** who has served as president since 1936, and who now becomes chairman of the board. Burke Roche was elected vice president in 1948, and has been in charge of the company's Industrial Division.

—o—

Richard K. Valentine has been appointed consultant in manufacturing for McKinsey & Co., New York.

—o—

G. A. Shallberg, executive vice president, Borg-Warner Corp., Chicago, sailed for Europe May 12. In England he will investigate the possibilities of expanding operations of manufacturing companies in which Borg-Warner is financially interested.

—o—

John W. Minor and **Louis O'Connor** have been promoted to assistant purchasing agents for Alabama Power Co., Birmingham.

—o—

Ivan L. Hillman, assistant treasurer and general credit manager, Dravo Corp., Pittsburgh, has been elected president, Credit Association of Western Pennsylvania. **J. S. Nichol,** secretary-treasurer, Harris Pump & Supply Co., was elected first vice president; **Fred T. Menges,** credit manager, Fairmont Foods Co., second vice president; **W. T. McCullough Jr.,** secretary-treasurer, W. T. McCullough Electric Co., treasurer.

—o—

V. A. Bingham, credit manager, Macwhyte Co., Kenosha, Wis., has been elected to the board of directors, Chicago Association of Credit Men for a term of three years, and **James I. Stang,** credit manager, Foote Bros. Gear & Machine Corp., Chicago, has also been elected a director for that term of office.

—o—

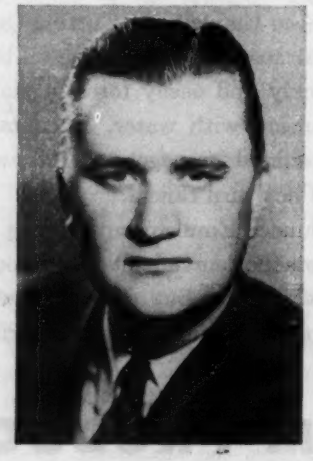
Philip H. Smith, director of research and development, John Nooter Boiler Works Co., has been elected chairman of the St. Louis Chapter, National Association of Corrosion Engineers.

—o—

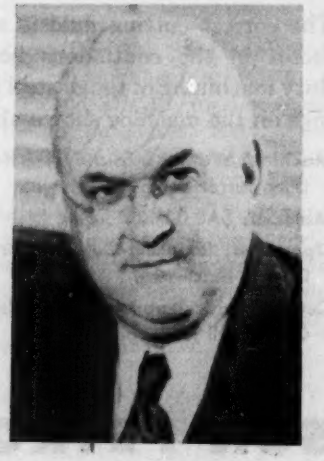
J. W. Adelung has been appointed manager of Mack-International Motor Truck Corp.'s Brooklyn branch, and **W. A. Brady** as manager of the White Plains, N. Y., branch.

—o—

Promotions in the wholesale organization, Pontiac Motor Division, General Motors Corp., Pontiac, Mich., are as follows: **C. L. Messecar** promoted from business management manager, St. Louis zone, to assistant zone man-

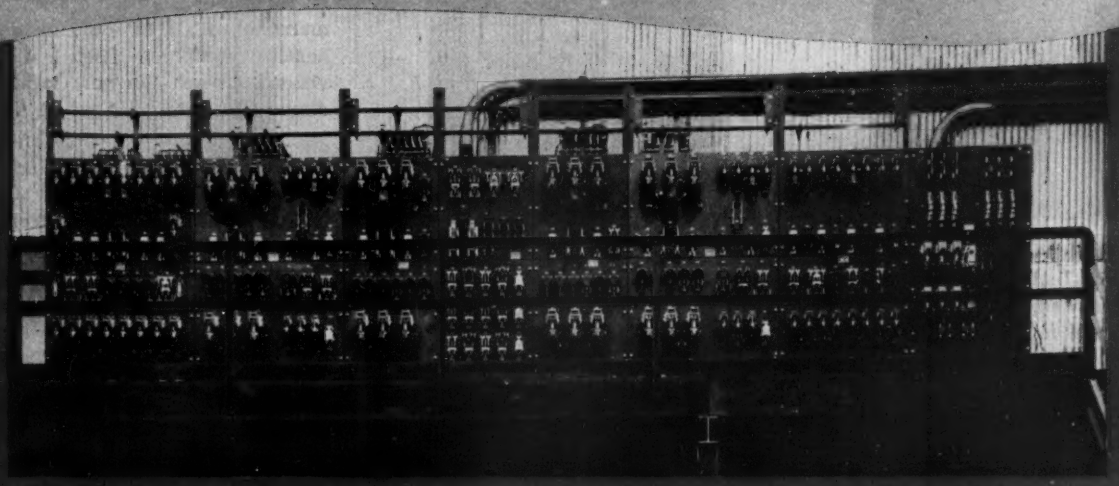


BURKE B. ROCHE

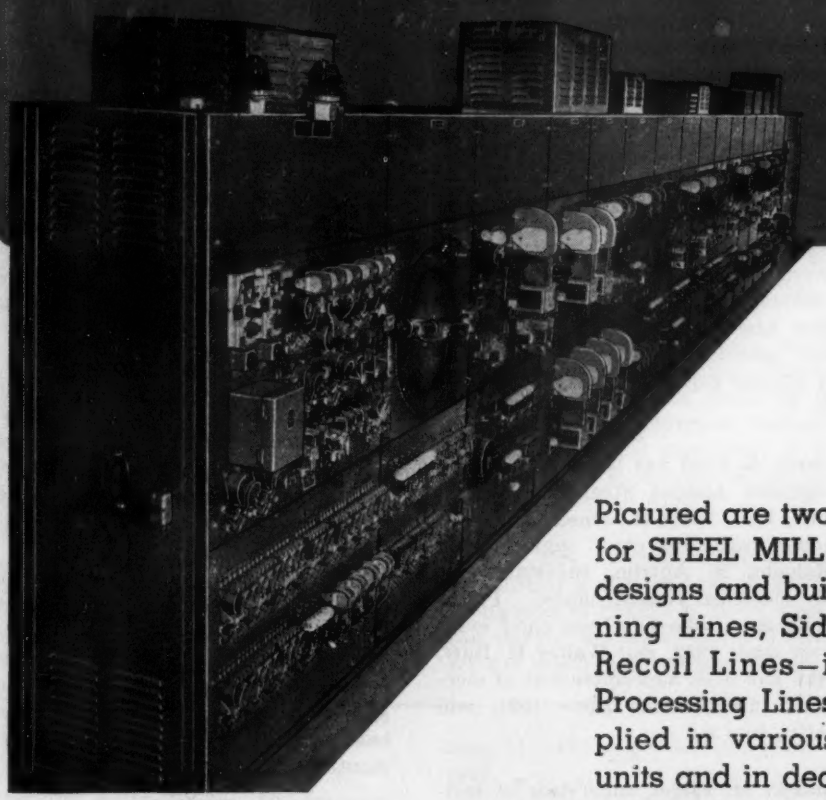


J. F. ROCHE

For every STEEL MILL Processing Line there's a CLARK control



Clark Factory Assembled Control for Hot-Coil Conveyer, 80" Hot Strip Mill



Factory Assembled Clark Control for 56" Pickle Line

Pictured are two typical CLARK control panels for STEEL MILL processing lines. CLARK also designs and builds control for Electrolytic Tinning Lines, Side Trimmers, Shearing Lines, Recoil Lines—in fact every type of Steel Processing Lines. These controls may be supplied in various types of factory assembled units and in dead-front cabinets. A full line of accessories, such as Brakes, Master Switches, Push Buttons, Foot Switches and Limit Switches, is also available.

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ager at San Francisco; **H. L. Robinson,** business management manager at San Francisco, to assistant zone manager, Los Angeles; **J. M. Turley,** business management manager, Portland, Oreg., to assistant zone manager, Cincinnati; **J. F. Malone,** business management manager, Boston, to assistant zone manager, Philadelphia. Other promotions are **R. B. Haley,** from service manager to business management manager, St. Louis zone; **F. G. MacDonald,** accessories sales, central office, to parts and accessories representative of the Pontiac, Mich., zone; and **E. J. Howard,** parts sales, central office, to parts and accessories representative, Memphis, Tenn.

—o—

British Iron & Steel Institute has awarded **Prof. J. H. Andrew** of Sheffield University the Bessemer gold medal for 1949 in recognition of his distinguished services to metallurgy and the iron and steel industry, with special reference to the valuable research work which he had conducted or which had been carried out under his guidance, and also in acknowledgment of his services to metallurgical education.

—o—

Dr. James R. Dudley has been appointed supervisor of new product development, and **John D. McPherson,** supervisor of market research activities for new product development department of American Cyanamid Co., New York.

—o—

Frank Gordon, Harcon Corp., Boston, former president, Boston Chapter, Institute of Scrap Iron & Steel Inc., Washington, has been appointed vice chairman of the export-import committee of the institute.

—o—

F. B. Davis Jr. has been elected chairman of the board of National Distillers Chemical Corp., New York, new chemical subsidiary of National Distillers Products Corp. Mr. Davis was formerly chairman of the board and chief executive officer of United States Rubber Co., of which he is a director and member of the finance committee.

—o—

Robert Gayle has been made vice president in charge of sales in the central and southwestern areas for McAllister-Ross Co., Chicago.

—o—

Everett S. Bissell has been appointed vice president in charge of sales, research laboratories, chemical engineering and process engineering, for Patterson Foundry & Machine Co., East Liverpool, O. He formerly was vice president and general manager of Mixing Equipment Co., Rochester, N. Y.

—o—

Harry A. Fohl has been named chief engineer, Lukens Steel Co., Coatesville, Pa. **Neils H. Jensen** has been named assistant chief engineer and **Malcolm B. Antrim,** superintendent of electrical maintenance. **P. C. Haldeman,** who has been chief engineer since 1932, and **Walter H. Burr,** who has been superintendent of electrical maintenance since 1921, will retire July 1.

—o—

Joseph M. Engel, supervisor of metallurgy, Republic Steel Corp., at Buffalo, has been elected chairman of the Buffalo Chapter of American Society for Metals.

—o—

James L. Crawford, vice president and general manager, Walsh Refractories Corp., St. Louis, has been elected president, succeeding **N. S. C. Walsh,** who was named honorary board chairman.

—o—

Ronald G. Lane has been elected comptroller, Gerrard Steel Strapping Co., Chicago, subsidiary, United States Steel Corp. He succeeds **B. H. Browne,** resigned. Mr. Lane has been associated with the company since 1940, and since 1945 has been chief accountant.

—o—

H. W. Milner has been appointed sales manager of all gas-burning domestic heating equipment, South Wind Division, Stewart-Warner Corp., at Indianapolis.

—o—

Andrew Hood has been elected secretary, Hudson Motor Car Co., Detroit, succeeding **C. D. Sterling,** resigned because of ill health. Mr. Hood is treasurer of the company and continues to hold that office.

—o—

Youngstown Sheet & Tube Co., Youngstown, announces three promotions in the order department. **George L. Williams,** supervisor in the Youngstown office, has been appointed assistant manager in charge of the department's Western Division at Chicago. **Dave Lewis,** supervisor, has been appointed assistant manager for the Eastern Division, with offices in Youngstown. **Fred C. Dyer,** clerk, has been appointed chief clerk with offices in Youngstown.

—o—

Howard J. Mather has been appointed assistant general manager of industrial finishes for Pittsburgh Plate Glass Co.'s Paint Division, Pittsburgh.

—o—

J. G. Schaefer has been named manager of the newly converted Youngstown district office of Allis-Chalmers Mfg. Co. Formerly a branch office, it has been moved from the Mahoning Bank Bldg. to the Ohio Edison Bldg.

—o—

John von Rosen, associated with Chrysler Corp., Detroit, for the past 17 years, has been appointed to the staff of **Herman L. Weckler,** vice president and general manager, on special assignment. Mr. von Rosen has been plant engineer of the Plymouth Division.

—o—

Hydraulic Equipment Co., Cleveland, announces it is expanding its sales organization and is establishing sales offices on the West Coast. **C. F. Rayment,** sales manager, will make his headquarters in Oakland, Calif., while this activity is being organized.

—o—

Ziegler Steel Service Co., Los Angeles, announces appointment of the following sales representatives: **Larry R. Butler,** 805 Echo, Fresno, Calif., to cover the San Joaquin Valley;

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CLAY P. BEDFORD

Named executive vice president, Kaiser-Frazer Corp., Willow Run, Mich. Noted in STEEL, May 23 issue, p. 87

PAUL E. LEES

Appointed vice president-sales, Standard Tool Co., Cleveland. Noted in STEEL, May 9 issue, p. 90

WILLIAM W. EGE

Vice president-sales, Wire & Cable Division, Copperweld Steel Co., Glassport, Pa. Noted in STEEL, May 23 issue, p. 87

Robert B. Franklin, 246 South First St., Phoenix, Ariz., to cover Arizona, New Mexico and western Texas.

—o—

L. W. Adams has been promoted to mechanical goods district manager for Goodyear Tire & Rubber Co. at Pittsburgh. He was field representative in Boston.

—o—

Hyatt Bearings Division, General Motors Corp., Harrison, N. J., has appointed two assistant purchasing agents. **George A. Burgermaster** and **C. Russell Todd** fill vacancies created with the retirement of **William E. Jones,** assistant purchasing agent since 1925, who has just retired, and the vacancy occasioned by the recent promotion of **Leo V. Farrell** from assistant purchasing agent to general purchasing agent, the position formerly held by **Frank A. Weiss,** now assistant to the general manager, **H. O. K. Meister.**

—o—

J. H. Ferguson has been named district manager of the Akron branch office of Bristol Co., Waterbury, Conn. He was associated for a year and a half with Western Electric Corp. in Philadelphia before joining the Bristol sales organization in 1923 as a sales engineer. Since 1940, Mr. Ferguson has been connected with the company's Washington office.

—o—

Ralph P. Stilphen has joined Diamond Alkali Co., Cleveland, as a special technical sales and service representative for the protective coating field.

—o—

Dr. Max H. Thornton has been appointed chairman of the Chemical Research Division at Midwest Research Institute, Kansas City, Mo.

—o—

Louis T. Friedman, formerly assistant professor of engineering, Champlain College, has been placed at the head of the metallurgical engineering department of Sam Tour & Co. Inc., and will be located in the laboratories in New York.

—o—

Norton Co., Worcester, Mass., has established a new district in the St. Louis area in charge of **R. O. Anderson,** district manager, who will transfer his headquarters from Denver to St. Louis. **H. G. Brustlin** has been appointed abrasive engineer in charge of the Denver territory, with headquarters at Denver. He will report to Mr. Anderson at St. Louis.

—o—

H. L. Montgomery has been named mechanical goods district manager of a newly created district for Goodyear Tire & Rubber Co., at Cincinnati.

—o—

Ernest A. Lauter has been appointed sales representative for parts of Ohio, Pennsylvania and West Virginia for Tipaloy Inc., Detroit. He will maintain headquarters in Cleveland, with branch offices in Cincinnati and Pittsburgh.

—o—

W. G. Skelly has been appointed assistant purchasing agent, Trackson Co., Milwaukee.

—o—

Robert E. Boak has been appointed Cleveland district manager for Apex Rotarex Corp., Cleveland. He has served for more than two years as assistant to the advertising and sales promotion manager.

OBITUARIES . . .

Torsten J. Lindstrom, 60, personnel director of the engineering department, Koppers Co. Inc., Pittsburgh, died recently.

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Edward S. Walton, 58, in charge of excess accumulations in the flat rolled sales department, Youngstown Sheet & Tube Co., Youngstown, died May 17 of a heart attack.

—o—

Orville B. Ewing, manager, New Orleans district office, Youngstown Sheet & Tube Co., Youngstown, died May 11. He joined the company in 1927.

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Wallace G. McCulloch, 34, chief plant engineer, L. J. Mueller Furnace Co., Milwaukee, died May 14 following a heart attack.

—o—

Edgar C. Thomas, 47, eastern representative and vice president, Thomas Machine & Mfg. Co., Glenshaw, Pa., died May 17.

—o—

John M. Whittle, 61, who retired last December as assistant to the president, International General Electric Co., died at Albany, N. Y., May 18.

—o—

Gerard F. Sheeran, 33, vice president and general manager, McCabe & Sheeran Machinery Corp., New York, died May 16.

—o—

James O. Carr, 76, director and honorary vice president, Allegheny Ludlum Steel Corp., died May 23 in Pittsburgh.

—o—

Ernest L. Davis, 69, president, Monmouth Products Co., Cleveland, died May 18.

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To meet today's conditions in the plating and metal finishing industry, involving changes in polishing compositions, automatic polishing, heavier and faster production and dirtier work with packed recessed areas, we offer MULTIPLE STAGE CLEANING for proper surface preparation . . A satisfactory and durable finish, regardless of the basis metal and the deposition of the coating (single or multiple), is only practical after the surface has been correctly prepared . . Whether your equipment is manual or automatic MULTIPLE STAGE CLEANING based on our well established "Lo-Hi" pH process can be engineered to fit the job . . . . . Ask the NORTHWEST man in your vicinity for his recommendation or write to us direct. . . . . All we need to know is what you are plating and your complete sequence—we'll give you the answer . . .

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Engineering News . . . AT A GLANCE

HIGH SPEED INSPECTION— Inspection of pistons in the Detroit Diesel Engine Division of General Motors Corp., is accomplished at a production-line pace by a continuous high speed automatic magnetic method now in use. In the setup, pistons are automatically picked up on a conveyor belt after finish machining operations, and are carried through a magnetic field during which compound is sprayed over and under the parts through jets fed by a pump. Both the latter and the magnetic cycle are controlled by an electric eye that synchronizes the process with the passage of each part through the magnetic coil on the conveyor. Pieces pass through and out of the magnetic field while the current it still on, magnetizing and demagnetizing the pistons in one continuous operation. At the end of the conveyor line, work is examined for imperfections under near ultraviolet light.

BOOSTS GRINDING WHEEL EFFICIENCY— Process of coating each grain of a grinding wheel with a microscopically thin shell of carbon in an isotropic vitrescent form, developed by Mansco Grinding Wheel Co., Cleveland, is reported to make the wheel highly effective for grinding carbide tools and other super-hard alloys. Wheels so treated are said to permit fast cutting operations with light passes that generate little heat. Life of the treated wheels, according to the company, is increased four to five times.

STRESS DETECTOR— Stress in electrodeposits now may be conveniently and accurately measured by means of a direct-reading instrument developed by the National Bureau of Standards, Washington. The device, which is adapted to both industrial process control and laboratory research, detects compression or tension in a specimen coating on a standard helix that transfers the reading directly to a dial as the helix changes curvature in response to forces acting within the plated layer. Because of its higher sensitivity, broader utility and greater ease of operation, the unit is expected to find extensive application in the investigation and control of electrochemical processes.

FROM "HAND TO MACHINE"— Selective fitting of pistons into cylinder bores, a process once done by hand, is now a mechanized proposition. In one engine plant, for example, a special device is used to measure each cylinder bore at four points marking the bore in one of eight sizes—an operation that takes but a few seconds for each engine. Another machine is used to measure some 500 pistons per hour. By automatic computation, it determines which size cylinder bore each piston will match. Special conveyors that automatically take orders from the cylinder-bore measuring device, are used to carry the proper piston sizes in correct sequence for fitting matching bores on the engine assembly line.

OVERCOMES FUME PROBLEMS— Sonic energy produced by a high intensity sound generator developed recently by Ultrasonic Corp., Cambridge, Mass., may be used for difficult dust, fume and mist collection problems. Referred to as a new tool for laboratory, pilot plant and production use, the unit is said to provide frequencies from 500 to 22,000 cycles per second to effect agglomeration of extremely fine particles in a gas stream. Aggregates thus built up, according to the company, may then be collected by cyclones efficiently. Unit also is finding wide use in metallurgical work.

NEW PLATING PROCESS—Any metal capable of being electrodeposited can be applied to magnesium in a very adherent manner, and on a production-line basis by a new process developed in the laboratories of Dow Chemical Co., Midland, Mich. Development, which was thoroughly investigated through tests and pilot plant operations, is said to open up many new applications for the metal where bright tarnish resistant surface is essential or wear resistance is required. In general, process consists of initial application of an immersion zinc coating followed by copper striking and electroplating in standard plating baths. (p. 56)

FAST BENDING OPERATION—In forming stripper loops for hay balers in the Auburn Works of International Harvester Co., the company currently is employing a machine that makes long radius bends in a single semi-automatic cycle without necessity of extra handling between bends. Long 180-degree bends are produced by a roller die at the rate of about 250 pieces per hour. (p. 59)

FORTY-ONE ORE SUPPLY—Total Eagle Mountain proved ore reserves, according to Kaiser engineers, are expected to meet Fontana's steelmaking requirements for another 40 years. Over 175,000 tons of ore, about half and half magnetite and hematite and analyzing about 54 per cent iron content, have been shipped from the mines so far. Another 110,000 tons are stockpiled and ready for shipment. Lower grade ores averaging 45 to 46 per cent iron are currently being segregated for possible future beneficiation. (p. 60)

IMPORTANT HANDLING "COG"— Because of its versatility and maneuverability, the fork lift truck is considered a very important power handling medium in short movements of materials. It is not a practical transport vehicle except for hauls not more than 150 to 200 feet. But in multiple stacking and jockeying loads around for better accessibility, the fork truck provides the most efficient performance. Furthermore, availability of various attachments not only increases versatility of this already versatile unit, but also broadens its utility in many fields. (p. 62)

Production Line Plating on

A NEW process has been developed and thoroughly investigated through laboratory tests and extensive pilot plant operations for electroplating on magnesium. With the advent of this new process which closely follows procedures for plating of other metals, any of the several metals capable of being electrodeposited can be applied to magnesium in a very adherent manner. Development of this practical production line procedure by Dow Chemical Co., Midland, Mich., opens up many new applications for magnesium where a bright tarnish resistant surface is essential or where wear resistance is required.

In general, the process consists in the initial application of an immersion zinc coating followed by copper striking and electroplating in standard plating baths. Herbert K. DeLong of the Dow laboratories was directly involved in the development of the new plating process.

Basis of New Method—Magnesium, being less noble than any of the common metals, readily replaces many of them from solutions of their salts. In acid solutions the immersion coatings are nonadherent and powdery, while in strongly alkaline solutions the coatings are more adherent, but insufficiently so as

Fig. 1 — Aircraft control wheel chrome plated magnesium casting

Fig. 2—Chrome plated magnesium printing plates and cylinders

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Copper, nickel, chromium, brass, gold, silver and other metals can be successfully plated on magnesium articles by means of a newly-developed practical process

Magnesium

to afford a base for electro-deposits. Most alkaline compounds, with the exception of pyrophosphates, do not attack magnesium. It was through the discovery that pyrophosphates did react with magnesium that the present method of zinc coating magnesium was possible. Pyrophosphates will readily dissolve oxide and hydroxide coatings from magnesium and actually brighten the surface. By the addition of certain zinc salts to the pyrophosphate solution an adherent zinc film is formed.

Quality of the zinc immersion deposit was found to depend to a marked extent on the rate of deposition and also the ratio of zinc to pyrophosphate. Too rapid a rate of deposition caused less adherent coattings to form; therefore various inhibiting salts were added to control the reaction rate. It was found that fluorides in small amounts were very effective and gave a much finer grained zinc coating and control of the rate of formation. The pH of the zinc bath was also a consideration as was the use of carbonates in adjusting and maintaining this factor in the proper range.

Pretreatment Solution—The most suitable solution for applying zinc immersion coating to standard magnesium alloys as a pretreatment for plating, using the pyrophosphate-zinc method, has the following composition and operating characteristics:

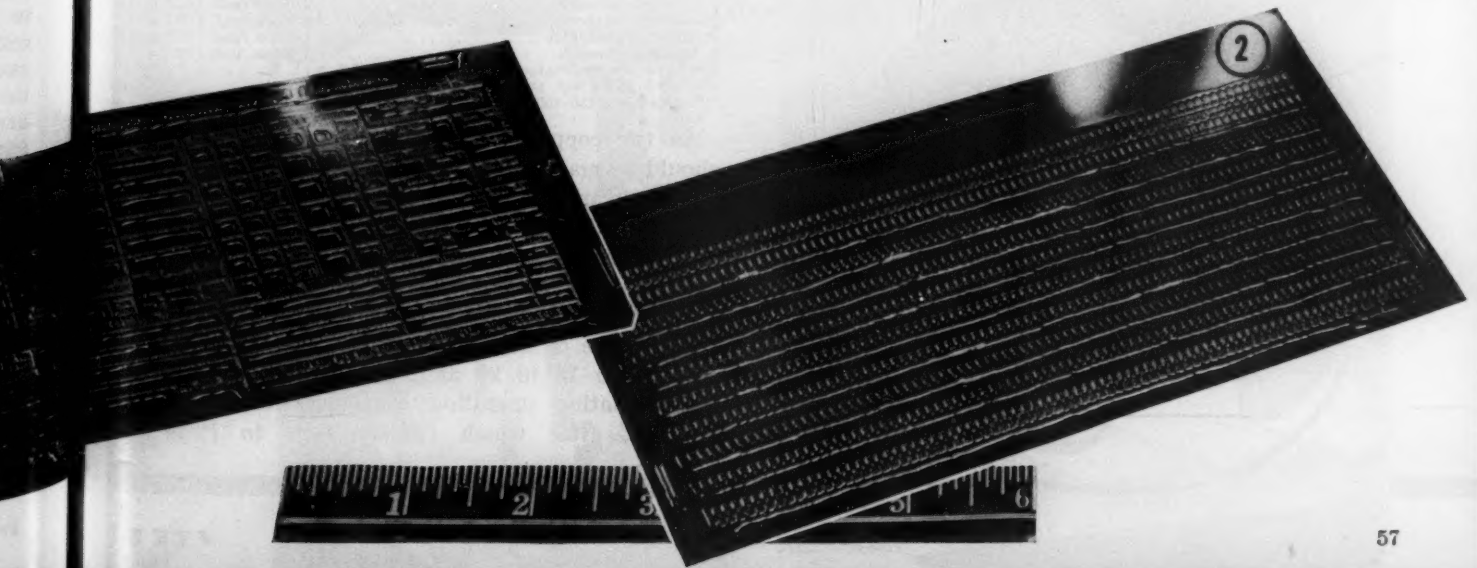
Tetrasodium pyrophosphate ($Na_4P_2O_7$)	120 g./L.
Zinc sulphate ($ZnSO_4 \cdot 7H_2O$)	40 g./L.
Potassium fluoride (KF)	10 g./L.
Potassium carbonate (K_2CO_3)	5 g./L.
pH	— 10.0–10.4
Temperature	— 175–185° F.
Treatment Time	— 3–5 minutes
Solution should be mildly agitated.	

Surface of the magnesium part gradually acquires a typical blue-gray color of zinc; after a continuous zinc coating is formed, gas evolution subsides to a point where little reaction is evident. Unalloyed or pure magnesium requires a lower fluoride concentration. In this case, 2.5 grams/liter potassium fluoride was found most suitable.

In the zinc immersion treatment bath the chemical compounds and concentrations, with the exception of the fluoride, are not exceptionally critical. The fluoride is added, as previously mentioned, to reduce the rate of immersion deposition on the magnesium surface.

While satisfactory deposits have been obtained in fluoride-free baths on some alloys, the conditions of time and temperature are very critical. In general, 1 per cent potassium fluoride, or 0.75 per cent sodium fluoride, gives optimum conditions for all the commercial alloys, while 0.25 to 0.50 per cent is most desirable for unalloyed or pure magnesium. If a greater percentage of fluoride is added, the rate of immersion deposition is retarded to too great an extent.

Actual temperature of the bath may vary from room temperature to boiling, although maximum adhesion and freedom from subsequent blistering is obtained at temperatures above 170° F and preferably at 175 to 185° F. The zinc bath has a relatively long useful life and depletes quite slowly in pyrophosphate and zinc. The bath can be analyzed and replenished by additions of these compounds. The fluoride is lost primarily by drag-out and need be added only at infrequent intervals. Carbonate is required only as a means of pH adjustment. The presence of heavy metal salts, other than zinc, in the bath must be kept at a minimum. Chromium salts are particularly detrimental as they tend to inhibit the zinc coating



formation if present in quantities greater than a few hundredths of 1 per cent.

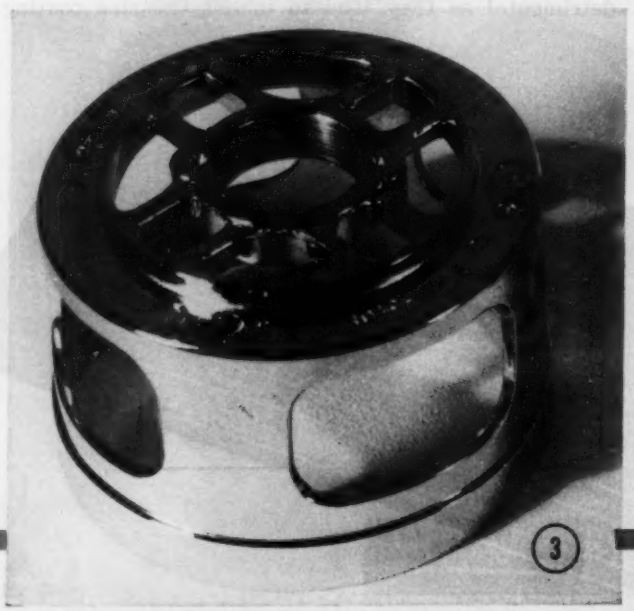
Production Line Operations—Based on the method developed in the Dow Chemical laboratories the following production operations may be set-up for plating on all types of magnesium alloys:

Step I—Preliminary Surface Preparation — This will vary depending on the nature and condition of the parts to be plated. In any case the surface should be free of nonmetallic contamination, such as the normal oxide on hydroxide coatings, scale, grease, oil, or previously applied chemical treatments. In some cases, to obtain a satisfactory surface condition, cast parts are pickled in 75-85 per cent phosphoric acid, while wrought parts are pickled in 20 per cent acetic acid plus 5 per cent sodium nitrate, the operation being carried out at room temperature for a period of 1 to 3 minutes. It is particularly important to pickle parts that are not buffed, so as to prepare the unbuffed surface for zinc coating pretreatment.

Many parts that are reasonably free of nonmetallic inclusions and are to be polished or buffed overall, may not require the preliminary pickle treatment. Photoengraved magnesium alloy printing plates, such as shown in final plated form in Fig. 1, do not usually require pickling prior to electroplating unless the plates have been stored and noticeably oxide coated after etching in the photoengraving process. In cleaning magnesium parts, where little dimensional change can be tolerated, a solution of 18 per cent chromic acid, with a treatment time of 2 to 5 minutes at room temperature is employed. This is followed by water rinsing and then by dipping either in hot 5 per cent sodium hydroxide, or 15 per cent hydrofluoric acid at room temperature, for 3 to 5 minutes to remove any chromium films.

Step II—Mechanical Operations—After pickling, if a smooth, highly polished surface is desired, parts to be plated should be wheel polished and buffed. In case of small parts, tumbling and accepted burnishing procedures may be used. If blasting is used, it should precede the preliminary pickling treatment described above.

Fig. 3—Die cast magnesium generator end, copper-nickel-chromium plated



Step III—Degrease—If buffing compound, oil or grease is on the surface, the parts to be plated should be solvent degreased by the ordinary methods used for other metal products.

Step IV — Alkaline Cleaner — Parts should be soak cleaned for 3 to 5 minutes at 180-212° F in an aqueous alkaline cleaning solution containing 8 to 12 ounces per gallon sodium hydroxide (NaOH) and 4 ounces per gallon trisodium phosphate ($Na_3PO_4.12H_2O$). Cathodic cleaning for 30 seconds to 1 minute in this solution at 20 to 40 A.S.F. at the end of the soak cleaning period is optional, but preferable. A wetting agent may be added to the cleaner to improve its detergency.

Step V—Rinse—Parts should be thoroughly rinsed.

Step VI—Pickle—The preferred pickle is 1 per cent hydrochloric acid, for a period of 15 seconds to 1½ minutes. Purpose of the pickle treatment is to activate the surface after the alkaline cleaning operation. Sufficient time should be allowed to produce a uniform etching which destroys all local passive areas which would interfere with the subsequent plating operation.

Step VII—Rinse—Avoid heavy metal contamination in rinse water.

Step VIII—Zinc Immersion Pretreatment—Apply zinc immersion coating using the solution previously described. It should be kept in mind that the success of the overall process is dependent almost entirely upon the adherence and uniformity of the zinc immersion film applied in this step. Therefore, careful operation of the zinc immersion bath is important in order to avoid rejects in final finished parts.

Step IX—Cold Water Rinse—Care should be taken to see that the rinse is maintained free from heavy metal contamination.

Step X—Copper Strike—The rinsed parts are transferred immediately to a copper strike of one of the two following recommended compositions.

Copper Strike Bath No. I

Copper cyanide	5.5 oz./gal. (41.3 g./L.)
Sodium cyanide	6.8 oz./gal. (50.8 g./L.)
Sodium carbonate	4.0 oz./gal. (30.0 g./L.)
Rochelle salts	6.0 oz./gal. (45.0 g./L.)
Sodium thiosulfate	0.25 oz./gal. (1.9 g./L.)

Free cyanide maintained at 0.75 oz./gal. (5.6 g./L.)
pH—10.0-11.0 (preferably 10.0-10.5)
Temperature—115-120° F.

Copper Strike Bath No. II

Copper cyanide	3.5 oz./gal. (26.2 g./L.)
Potassium cyanide	6.1 oz./gal. (45.7 g./L.)
Potassium carbonate	2.0 oz./gal. (15.0 g./L.)
Potassium hydroxide	1.0 oz./gal. (7.5 g./L.)
Potassium fluoride	4.0 oz./gal. (30.0 g./L.)

Free cyanide maintained at 1.0 oz./gal. (7.5 g./L.)
pH—12.8-13.2 (Not as critical is in bath No. I)
Temperature—130-150° F. (140° F. preferable)

In the copper strike operation, electrical contact should be made quickly and a high current density of 30 to 40 amp per square foot applied for the first 30 seconds to 1 minute. Prolonged high current density striking is avoided as it is apt to cause inferior adhesion and possible subsequent blistering on high current density areas of the work. After 30 seconds to 1 minute of deposition, the current density is decreased to 15 to 20 amp per square foot and the strike plating operation continued for at least 5 minutes, after which (*Please turn to Page* 86)

LOOP FORMING

. . . cold drawn steel strips, using tangent bender and hydraulic forming machine

By H. J. HUNTER
Chief Tool Designer, Auburn Works
International Harvester Co.
Chicago

AMONG parts used in all three models of automatic pickup hay balers built by International Harvester Co. are U-shaped stripper loops. Function of these parts is to guide hay that is picked up by picker fingers to the auger that feeds the hay into baling position. Stock employed for one of these loops, made in the Memphis Works is 18-gage cold drawn steel which is blanked into strips 2 29/32 x 60⅝ inches. The other loop, produced in the Auburn Works is slightly longer. Strips are embossed to form one or two longitudinal stiffening beads before being bent.

One design of loop has a single bead, one pointed end and a square end bent at right angles over a short radius. Another design has two beads, one rounded end and the square end bent back over a short radius. Production of both types is described here.

Stripper loops for the model 50-T baler, built at the Auburn Works, are formed (after blanking and beading) in a two-step process. The bend near one end around a short radius is made in a press. Then eight strips are placed on the bed of a Struthers Wells tangent bender, Fig. 1, and are bent around rocking forms.

This two-step process, though involving extra handling, is adequate for production needs on 50-T balers and was used initially (*Please turn to Page* 68)

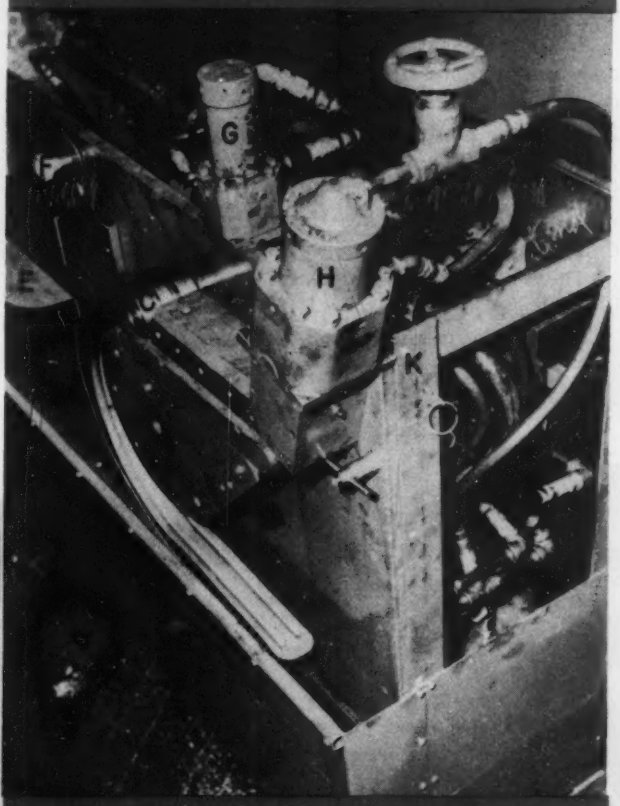
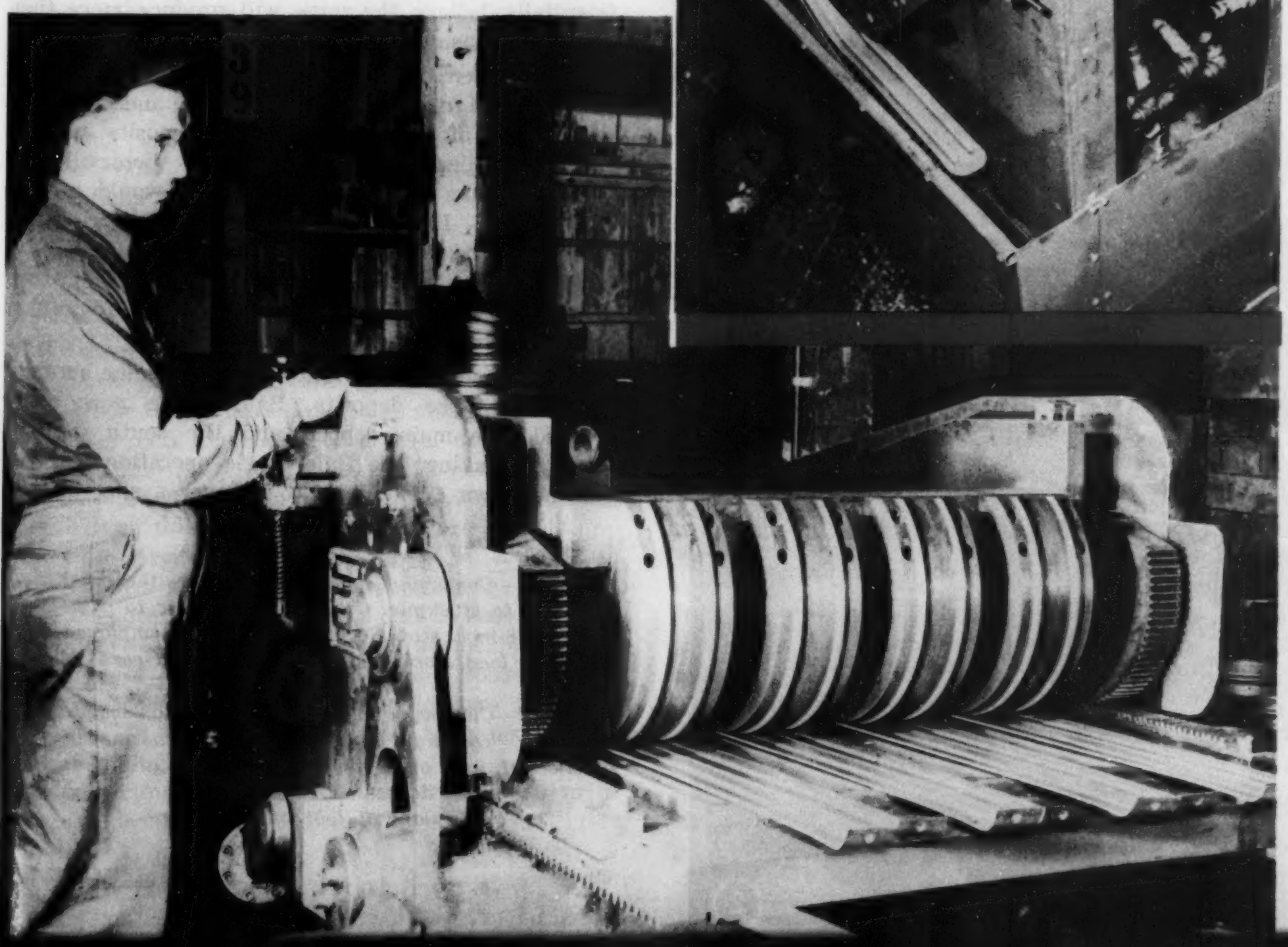


Fig. 1 *(below)—After short radius bends are press-formed on one end, eight blanks are set as shown in this tangent bender*

Fig. 2 *(right)—Inside of hydraulic machine. Formed stripper loop with two beads is ready for ejection from machine*



EAGLE MOUNTAIN IRON

Expected to Meet Fontana's Requirements for 40 Years

Kaiser engineers believe mine will produce more than 70 million tons. It currently is supplying 80 per cent of the ore requirements of Fontana's single blast furnace and will supply a second 1200-ton stack under construction

AT FONTANA, Calif., 45 miles inland from Los Angeles in the orange grove country, the Kaiser Co.'s postwar steel expansion program is rapidly taking shape.

Another 164 miles by rail out in the desert, Kaiser's new Eagle mountain mine now is providing 80 per cent of the iron ore requirements of the single blast furnace at Fontana and it will supply the second 1200-ton stack now being constructed and scheduled to go in Nov. 1. Kaiser plans to continue using 20 per cent of the iron ore requirements from mines at Cedar City, Utah, the two grades being blended prior to charging. The Vulcan mine at Kelso, Calif., has been closed.

The Eagle mountain mine specifically is located about 15 miles north of Desert Center, Calif., on U. S. highway 60 which is midway between Indio & Blythe, Calif. The ore is shipped over the company's own railroad, 52 miles long, to Ferrum on the Southern Pacific Railroad. The ore then moves another 112 miles over the Southern Pacific to the Fontana plant. Kaiser executives point out that the 164-mile ore haul is the shortest of any major steel plant in the country using high grade ore. Over 175,000 tons of ore, about half and half magnetite and hematite and analyzing about 54 per cent iron content, have been shipped from the mine so far. Another 110,000 tons have been stockpiled and are ready for shipment. Lower grade ores averaging 45 to 46 per cent iron are being segregated for possible future beneficiation.

Forty-year Reserves—Total Eagle mountain proven ore reserves are estimated at about 25 million tons and are expected to meet Fontana's requirements for another 40 years. In fact, Kaiser engineers confidentially believe the mine will produce more than 70 million tons.

If and when this deposit is exhausted, Kaiser has ore holdings near Victorville, Calif., and at Silver Lake north of Baker, Calif. Both deposits are less than 175 miles from Fontana. The Victorville ore runs less than 40 per cent iron and would require beneficiation. However, the Silver Lake material is of bessemer type, low in phosphorus, and runs about 56 to 57 per cent iron. There are about 3.5 million tons of this ore available in addition to 12 to 15 million tons at Victorville.

Three Deposits—The Eagle mountain mine actually comprises three deposits, Bald Eagle now being worked, the main deposit and the south deposit. Simply speaking, the Bald Eagle operation involves carving down a mountain to uncover a slice of iron

Fig. 1—Conveying setup leading from the crusher, right, to stockpile. Crusher reduces ore to a maximum 8-inch size. Second conveyor is employed to load stockpiled ore onto railroad cars

Fig. 2—Close-up of Bald Eagle operation which involves "carving" down a mountain to uncover a slice of iron ore lying longitudinally at an angle of about 45 degrees. Ore is trucked to crushing plant at foot of mountain

Fig. 3—View of Eagle mountain mine which shows Bald Eagle operation, foreground, in relation to main and south deposits, center background. A 52-mile railroad links mine with the Southern Pacific and the Kaiser steel plant at Fontana, Calif.

ore lying longitudinally at an angle of about 45 degrees. The "carving" is accomplished by blasting off sections and loading the material into 10-yard Euclid diesel-powered dump trucks. The rock is hauled a few hundred feet and dumped out of the way. As the iron ore is exposed it is trucked down a winding road to a crushing plant at the foot of the mountain.

Fourteen trucks now are in service, including three new ones purchased recently. On a single 8-hour shift, these trucks have handled as many as 900 loads averaging 17.5 tons each, or a total of over 15,000 tons of material. A new 4½-yard Bucyrus-Erie electric powered shovel was placed in service a couple of months ago to supplement two 2½-yard shovels previously in service.

Stockpiled by Conveyor—The crushing plant reduces the ore to a maximum 8 inches in size. Crushed ore is carried by conveyor line to a stockpile at the terminus of the railroad. A second conveyor line loads the ore directly into railroad cars from the stockpile. A track scale has just been installed to save weighing time in transit.

Construction of the railroad involved a number of unusual problems. Elevations range from 190 feet below sea level at the Ferrum terminal to 1372 feet above sea level at the mine. For instance, on the last 7 miles of the road approaching the mine, it was necessary to make nine surveys to ascertain a proper route to maintain the required grade. The final 4 miles is a giant S-curve with maximum grade of 2.15 per cent and compensated for curvature.

While the entire area is in the desert, it is subjected at certain times of the year to unexpected cloudbursts with the run-off at one crossing alone reaching the tremendous volume of 20,000 cubic feet per second. In addition to the usual dykes, channels, bridges, etc., it was necessary to use 14,000 lineal feet of culverts ranging from 30 to 72 inches in diameter.

Also, the desert heat often reaches a maximum of 120° F, thus evolving a rail expansion problem. The rails have been laid to provide a minimum gap of 1/16-in. at 125° F between the rails but Kaiser engineers still anticipate a maintenance problem.

Two Train Loads Daily — The 1500-hp Baldwin diesel-electric locomotive used in hauling the ore trains to Ferrum is fitted with special dynamic braking to aid in holding down speeds to 15 mph on the grades. Trains are made up of 30 side dump ore cars provided by the Southern Pacific and loaded 60 tons per car. Two trips are made daily on an 8-hour schedule each. When the new blast furnace goes in, will be necessary to step up the daily tonnage from about 2000 to 4000 tons.

EFFICIENT HANDLING

Can Cut Production Costs

Part V of the current series

Fig. 34 — Fork lift truck tiering a pallet load of hydraulic cylinders. Courtesy Clark Equipment Co.

Fig. 35 — Small, light-weight fork trucks work effectively in narrow aisles, congested areas and between machines. Courtesy Baker-Raulang Co.

Fig. 36 — Gasoline fork truck with hook attachment handling heavy castings. Courtesy Lewis-Shepard Products Inc.

Fig. 37—Fork truck equipped with a special scoop and unloader accessory handling 200-pound bags of forgings. Courtesy Towmotor Corp.

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By WALTER F. TOERGE
Associate Editor, STEEL

METHODS

Continuing the discussion of industrial trucks' place in metalworking operations, this article reviews some installations of special wheeled vehicles and fork lift trucks equipped with interchangeable attachments

IN the movement and storage of palletized loads, fork trucks are by far the most widely used means of transportation within plants. Equipped with special attachments, they are also useful in handling large or unusually-shaped parts individually, or in transporting unit loads without pallets. With many models and capacities available, choice of the truck for the application hinges upon the same factors mentioned previously in connection with other types of materials handling equipment, i.e., nature of loads to be carried, condition of floors, plant layout, distances to be traveled, heights to which material must be lifted, etc.

Truck characteristics such as capacity (which ranges from about 1000 to 50,000 pounds), mast height, lift height (some trucks can lift up to approximately 15 feet), weight and source of power are without significance unless they are considered in relation to the above factors. The principal differences in trucks are the three distinct types of power sources—gasoline engine, storage battery or gasoline-generator. Each type has its advantages and selection of one type as against another is a major decision.

Most important function of a fork-lift truck is lifting and placing loads. It is not a practical transport vehicle except for short hauls, not more than 150 or 200 feet. Other methods for horizontal movement—tractor-trailer trains, for example—are far more economical for longer hauls. But in multiple stacking, lifting and placing loads, the fork lift truck finds it field of most efficient operation. Because of its unusual versatility and maneuverability it is the most important power truck in industry.

Fork Truck Attachments—While the benefits to be derived from pallet-fork truck systems in the receipt, storage and shipment of materials are well recognized, operation of the single basic tool, the fork truck, using interchangeable attachments, is of considerable interest. Scope of a fork truck's activity in the metalworking industries is much broader than merely lifting and transporting palletized unit loads. Scoops for bulk material, rams for coils, fork extensions, clamp lifts, revolving heads capable of rotating 360 degrees, cranes with hook and chain, brick forks, are but a few of the auxiliary attachments used to make standard fork trucks even more versatile.

In many foundries, attachments have been developed to handle ladles filled with molten metal. A unit in the form of an apron fits over the tines and holds the ladle firmly while it is being transported. By using another special adaptor, the same truck might carry hot wheels immediately after they have been cast, to the cooling floor.

A foundry job study reported recently[28] concerned the transportation of metal in buckets from storage to furnace, charging a rotary melting furnace, carrying castings to the heat treating department and placing them in annealing ovens. Equipped with a special bucket and bucket holder, fork lift trucks perform all these jobs and in addition unload metal ingots and sand from railroad freight cars, move machine shop salvage from machine room to storage and handle transfers of lathe turning and boring heads. Formerly, furnace charging took from 20 to 30 minutes. Now, the entire operation is performed

Fig. 38—Designed for indoor and outdoor operation, this 1000-pound capacity mover equipped with automatic dump bucket is shown in operation in a steel plant. Courtesy Bell Aircraft Corp.

in an elapsed time of 3 to 4 minutes.

By the old scrap handling method, six to eight 1000-pound bucket loads were required for a single heat. Four men did the shoveling by hand. With a fork truck doing most of the work, this same job is completed in 4 hours less time, using three less men. Heats for the following day's charging are now made up during the late afternoon, using the time saved by fork truck handling. Thus the furnaces can be fired immediately next morning.

Steel Coil Handling—In the manufacture of steel strip, fork trucks or ram trucks are widely used to handle coils between processing points. Coils are wound at the end of the hot mill by an automatic coiler and carried by gravity roller conveyor to a power-operated up-ending device. Most truck handling occurs at temporary storage, where the infinite maneuverability of the fork truck is a great advantage. Intermediate trucks of 15,000 pounds capacity and balanced to handle 48-inch diameter coils operate here.

From the storage area to picking lines the same

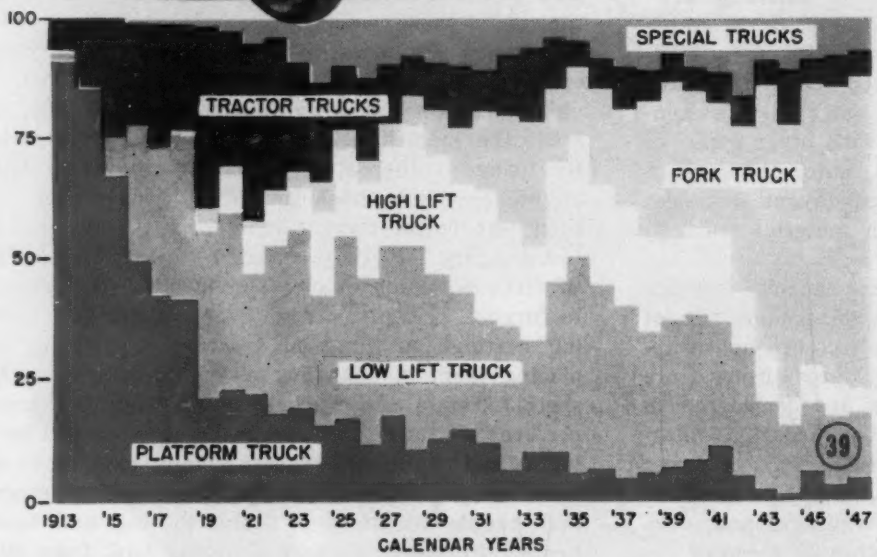
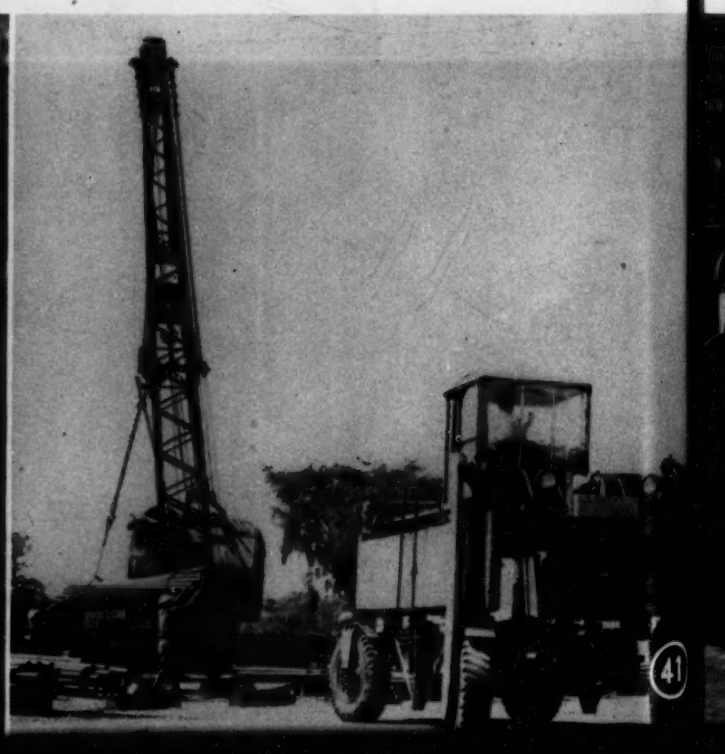


Fig. 39—Sales trends by types of electric trucks, showing percentagewise distribution of bookings among types of equipment. Courtesy Electric Industrial Truck Assn.

Fig. 40 — Motorized revolving fork carriage attachment on center control industrial truck dumps a skid-box load of small automotive parts into stationary hopper at work station. Courtesy Automatic Transportation Co.



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method of coil handling is used. Coils are picked up by inserting a round or tapered horizontal shaft into the coil center. One end of the shaft or ram is fastened to the fork truck carriage. At the beginning of the pickling line several coils are welded together to speed up further processing, so coils leaving the pickler line may weigh 30,000 or even 60,000 pounds. Ram trucks transfer coils to storage or directly to cold reduction mills.

After cold reduction, coils are handled by ram trucks and once again placed in temporary storage or annealed immediately. Following annealing, an overhead crane picks coils out of the furnaces and places them back on a transfer car for movement to an area near the temper mills. From this point, ram trucks transport coils weighing close to 30,000 pounds to the temper mills.

Until about 1934, slow rolling speeds of mills did not require large coils. Lost rethreading time suddenly became very important as rolling speeds were increased—up to 70 mph. A 5-mile long strip of steel, at that rate, will run through the mill in less than 5 minutes. Consequently coils must be larger to prevent slowing up and stopping mills for rethreading. The simultaneous development of large capacity industrial trucks has kept apace of the industry's requirements, so that maximum production can be maintained. The engineering problems encountered in this transition are, obviously, extremely complicated.[29]

In handling its products, one shop was faced with the problem of picking up and transporting bagged forgings (average 200 pounds per bag) and loading them directly into railway freight cars. Lifting bagged products is a difficult and dangerous task because the weight is unevenly distributed and the contents may shift suddenly during handling. In addition, manual handling of bags is a tedious, expensive method. Since the bags were not of uniform size and shape and regular palletizing would require some manual handling, a speical method had to be devised.

A standard industrial fork lift truck, equipped with a mechanical unloader accessory and a specially-designed scoop attachment now handles as many as ten or twelve 200-pound bags in a single load. Bags are transported to storage or to shipping dock and unloaded, with no manual effort. Not a single employee touches the bags. In 3½ hours, eight hundred 200-pound bags of small forgings are lifted, transported to the weighing station, carried into a freight car and unloaded. A round trip of 750 feet is completed in only 1¾ minutes, with a 2000-pound load.

In plants where bulky waste material must be disposed of periodically, two or three operations are often eliminated by means of a revolving head attachment on a fork truck. Machine shops, for example, use a fork truck equipped with standard forks and a revolving head to pick up, move and dump a tote-box full of scrap.

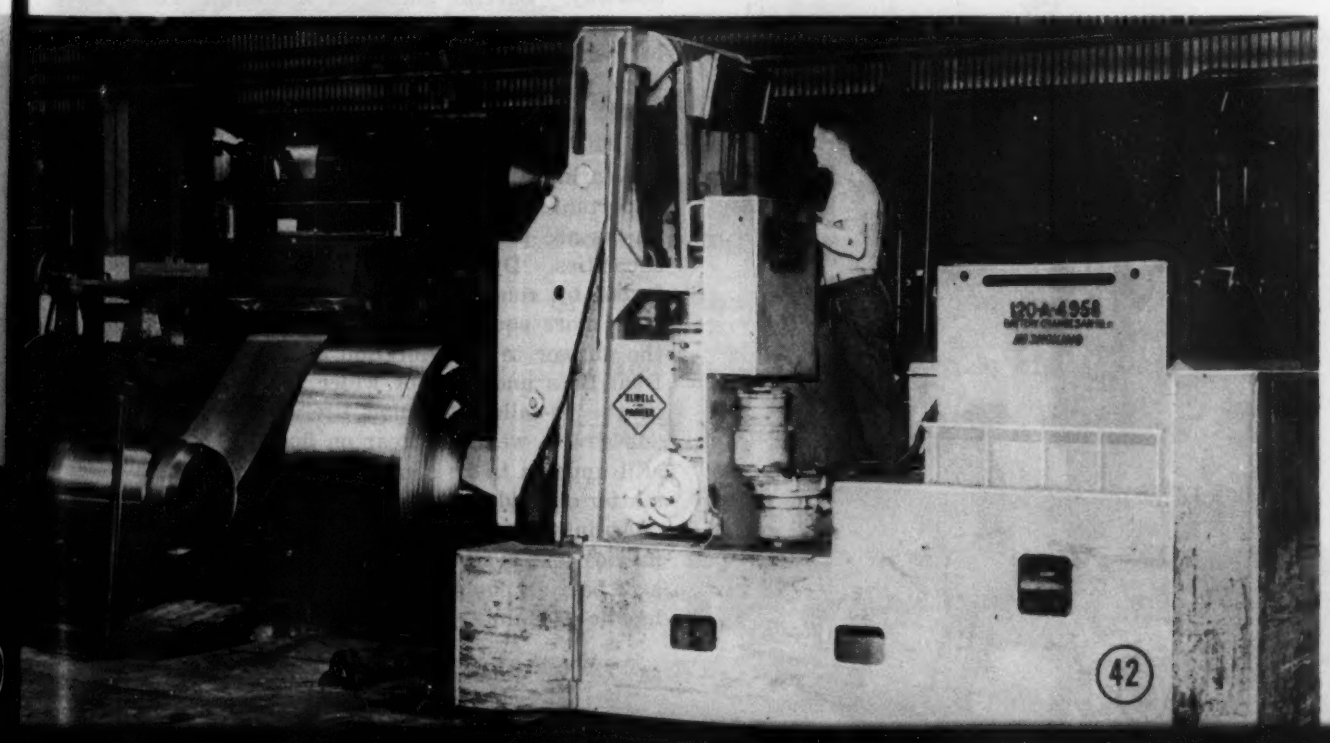
Another example of specialized work is the unloading and handling of steel wire and coils at the rate of 100,000 pounds every 1¾ hours, using a ram attachment with a fork truck.

At the plant of a plumbing supply manufacturer, long, heavy pipe is hauled by a fork truck equipped with a crane attachment. Great savings in time and manual effort are reported to have been effected. Other heavy, bulky items in the same plant are moved by gas-powered and electric battery-powered fork trucks six times faster than was ever done before. Oil tanks 4 feet in diameter by 6 feet long are fork truck handled, two at a time. Crated bath tubs, cast iron boiler sections, radiators, are some of the other loads which are transported and stacked by fork truck.

A direct saving of 125 man hours, or $112.50 per week resulted from handling 750-pound railroad car wheels by fork truck with special attachment. For-

Fig. 41—Radio-equipped straddle truck with load of unfinished tubes. Courtesy Motorola Inc.

Fig. 42—25,000-pound capacity fork truck with ram. Courtesy Elwell-Parker Electric Co.



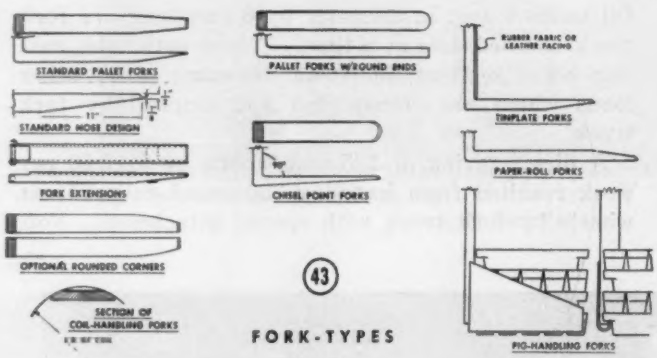
merly, five men were employed to roll the wheels from the cleaning room to storage areas 300 feet away. The round trip averaged about 3 minutes. Now, wheels are rolled by manpower only 10 to 20 feet to a point just outside the cleaning room door. A fork truck then picks up five wheels at a time and transports them to the storage areas, completing the round trip in the same time one man needed to make the identical trip, while he was rolling only one wheel.[19]

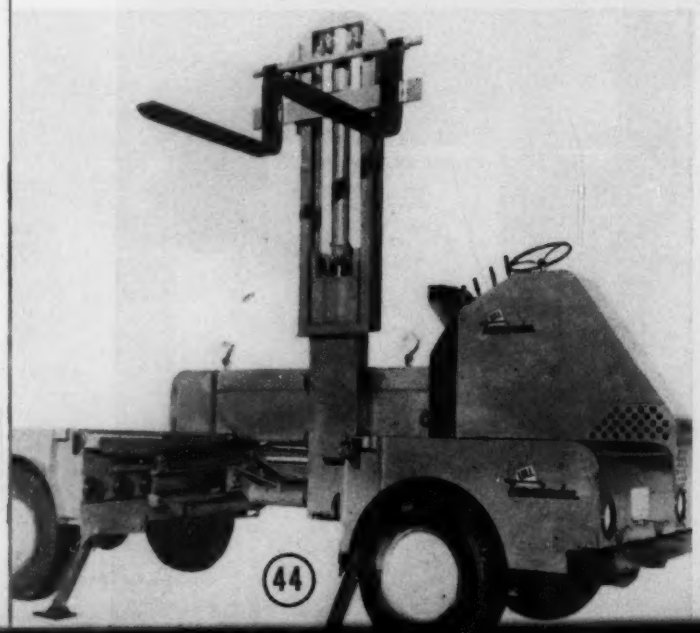
General Applications—Industrial fork trucks in operation in a tractor manufacturer's plant are used primarily to move parts between production operations. At reclining stations, pallet loads of heavy castings are picked up and carried to temporary storage. Here they are stacked two pallets high. From this point they move to the beginning of the subassembly line. Many different sizes, shapes and weights of parts such as pulleys, front frames, clutch housings, cylinder heads and blocks are carried daily to the 37 stations which comprise the main 525-foot production line. Average output per 8-hour day is 100 tractors.

Elsewhere in the plant, a 1200-ton hydraulic drop press forms steel sheets into fenders and other parts. This equipment is serviced by a fork lift truck

Fig. 43—Fork types. Courtesy Electric Industrial Truck Association

Fig. 44—Combined fork lift truck, carrier and motor truck unit capable of lifting, stacking and transporting. Courtesy Lull Mfg. Co.





which handles the 6-ton dies. Savings calculated in connection with the press-truck combination include the following items: Elimination of expense of paying an outside processor for drawing the sheets; expenditure of time, labor, etc., involved in expediting and reshipping materials; flexibility of production schedules is increased.[28]

In handling steel castings and forgings by fork truck a machinery company saves nearly 41 cents per ton on labor. Three men now unload a 90,000-pound capacity railroad car in 4 hours as compared to 7 hours by the previous method which required five men. Castings and forgings, each weighing 22 to 36 pounds are carried, 100 at a time, in 3 x 3 x 3-foot tote boxes. Empty boxes are loaded at the cars, moved by truck to outside storage areas and stacked 3 feet high. From this point, boxes are trucked to the production machines.[30]

Truck Design — Considering the fact that many plants not originally designed for fork trucks are now using this kind of material handling equipment, design of trucks to operate in narrow aisles and in close quarters generally, is of great importance. Truck manufacturers have made several truck design improvements for adapting present cramped facilities to unit load-fork truck operations.[31] Trucks are now available which are capable of stacking 36-inch 2000 to 3000-pound loads in 9-foot aisles. They need only 57 inches for turning in intersecting aisles. Others will stack a 30-inch load at right angles in an 8-foot aisle. Where aisle space is limited, loads stacked at angles can make right angle turns unnecessary.

As for the telescoped height of mast, low doorways, elevators, tunnels, bridges and railroad car doors can make this feature of truck design extremely critical. Maximum stacking lift required seems to be the controlling factor in determining low telescoped mast height.

Several trucks are available with 83-inch telescoped height, with a 130-inch total lift, or 68-inch telescoped height with a 108-inch total lift. An 83-inch high truck can pass through a regular 7-foot doorway. Several makes of industrial trucks have low overall lowered mast height and relatively high lift, with a free lift of approximately 60 to 65 inches, made possible by triple multiplication of chains, telescopic cylinders, double telescopic cylinders and cylinder within cylinder.

Wearing and operating characteristics of tires are important because weight and weight distribution of trucks are problems to users with limited floor load capacities. Dynamic loading of floors is greatly affected by condition of tires. Distributing the load over more square inches of floor area seems to be the answer to the vibration effects of loaded trucks. Dual tires and tires of wider cross section, and use of the so-called "cushion tire" are truck designers' answers to wear and tear on floors. However, there still appears to be some difference of opinion on the matter of solid vs pneumatic tires.

An interesting two-way FM mobile radio truck communications system is presently in operation at a 250-acre bearing plant which uses three straddle trucks to handle semifinished bars and tubes in baled loads

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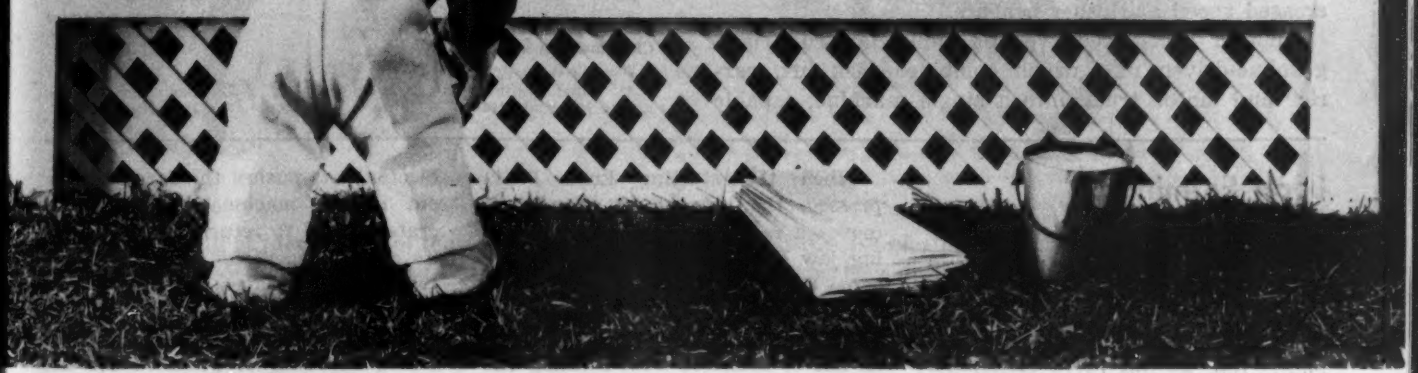

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weighing up to 10,000 pounds. Dispatcher control of the trucks was always a problem. Now a 30-watt central station and three 10-watt dispatcher units take care of supervising the trucks' whereabouts. Immediately after installation of the radio equipment one truck went on standby. Truck shifts of 8-hours duration each, were cut from seven to five per day. Checking results 30 days later, the company revealed that two trucks had handled 354 more bales than had the three trucks the month before, and at a saving of 39 operating hours.

Final processing of customers' orders was cut anywhere from 48 hours to 5 days made possible by the so-called "open" control system.

The importance of effective dispatching systems can hardly be exaggerated, as the example just cited so well demonstrates. Generally, flow of work determines method to be used to control trucks, depending upon the number of handlings necessary in any sequence of manufacturing operations. There is no "best" system. Every plant has its own needs.

In the realm of special trucks, manufacturers have used plenty of imagination in designing equipment to do specific jobs. Among these are the straddle-type trucks mentioned above in connection with the radio communication system. The bearing plant involved realized savings of $15 per day in addition ot increased speed and other benefits.

Another specialized type of industrial truck is a gasoline-driven unit which combines fork lift, carrier and motor truck into a single machine, capable of loading, lifting, stacking and transporting loads of steel, tubes, pipe, pallets, etc., weighing up to 10,000 pounds. On the opposite end of the capacity ratings scale is a three-wheeled mover which carries 1000-pound loads in a bucket or on an interchangeable wood and steel platform deck. Three gallons of gasoline will operate this unit for 8 hours continuously. Both these trucks are shown in the illustrations.

(To be concluded)

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Loop Forming

(Concluded from Page 59)

to form loops for the newer and somewhat smaller model 45 baler, the loops then being shipped to the Memphis Works where this model is built. But, as this extra production overloaded machines available at Auburn, a new machine, Fig. 2, designed by the writer, was built and set up in the Memphis plant.

Parts of the machine are actuated by four hydraulic cylinders and construction is such that both the short radius and the long radius bends are made in a single semiautomatic cycle with no handling between bends. Long bends, approximately 180 degrees are produced by a roller die. A production rate of 250 pieces an hour is attained by a single operator. This is a much higher rate than is attained at Auburn on the tangent bender.

Stock already blanked and beaded is inserted above the clamping jaw B, Fig. 3, and with the square right end against an adjustable stop or gage. The piece rests on the clamping jaw B and over a finger D that extends through the front plate on a level with the ledge E that projects outward from a guard plate spaced about 4 inches from the front plate.

When the starting knob F is pressed, the plunger in cylinder G moves a rack that closes the clamping jaw B to grip the stock. At the same time, a valve is opened, plungers in cylinders H and J are operated and the finger D is withdrawn so as not to interfere with forming the stock. The plunger in cylinder H forces the punch I of the forming die downward and produces the small radius at that end of the piece.

At the same time, the plunger in cylinder J operates the roller die by moving a crank pin on which the roller turns. The roller, moving though a 228-degree arc, forms the piece around a large radius to the positions shown in Fig. 2. This motion allows for springback and produces the long radius 180-degree bend.

At the end of its motion, the roller die trips a dog which reverses the valve to cylinders H and J, moving their plungers backward. One plunger opens the short radius forming die and the other moves the roller back to its original position. In returning, the roller opens a valve that releases the clamping jaw B. At the end of this roller return travel, another valve for a fourth cylinder, not shown, is opened and the plunger in this cylinder operates an ejector that pushes the formed piece out of the machine and then operates a trip to return the ejector to its original position. This completes the cycle and leaves the machine reset for reloading.

At the end of the machine is an emergency ring K provided for use in case the machine jams because of faulty stock. If this ring is pulled, any stock in the machine is ejected without the machine having to go through its forming cycle.

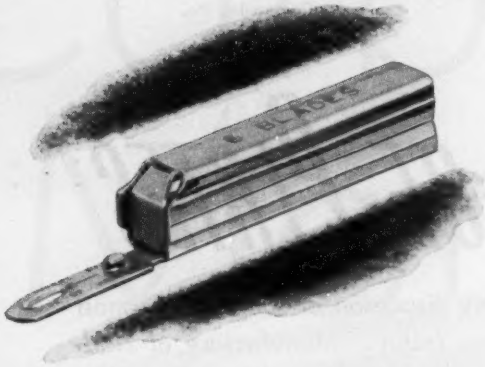
To permit the machine to be used in forming another part, roller travel is made adjustable and the cylinder H is locked out, as the piece does not require the small radius bend.

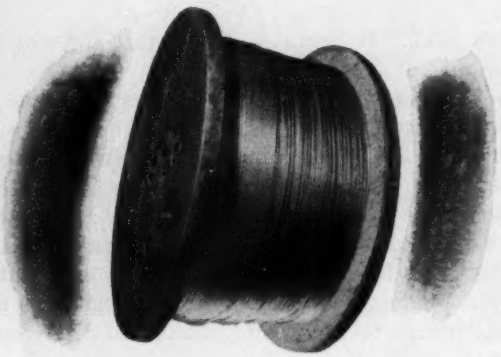
To make the machine a self-contained unit, it is provided with its own pump which, as well as the valves, are Dennison Engineering Co. products. Hanna hydraulic cylinder units are used.

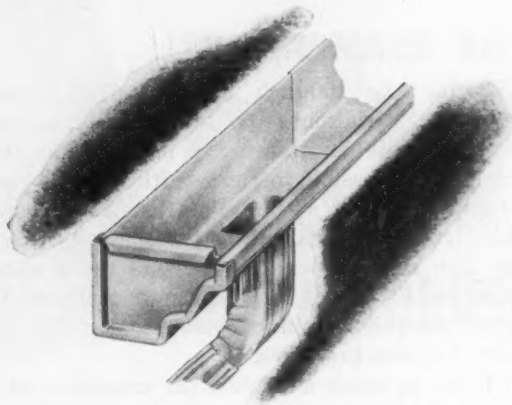
—o—

Described as a combination catalog, price list, textbook and reference manual is the 116-page publication on fixed gages announced by Sheffield Corp., Dayton, O. It is an illustrated handbook of factual and useful information for the buyers and users of perishable gages and includes specifications, diagrams and tables.

BEAT COMPETITION WITH IMAGINATION ... REDESIGN WITH ALUMINUM







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By W. LOUIS BUNTING
Superintendent of Plate Mills
Lukens Steel Co.
Coatesville, Pa.

PRODUCTION OF PLATES

In this second part the author continues his discussion of some of the most outstanding plate rolling units in operation today. Manufacture of clad-steel material is reviewed together with specifications used in the production and purchase of plates

PART II

SLABS for the 100-inch mill come from several sources and variation from nominal thicknesses is considerable. When slabs vary in thickness to any extent, it is impossible to gage width in the broadside mill to any accuracy within limitations of the capacity of the vertical edger ahead of the reversing rougher.

The slab squeezer can compensate for a wide variety of errors in the broadside mill owing to variations in thickness from one slab to another by its capacity to press the edges.

With the squeezer available, the broadside mill can always roll to a safe width without any concern for the limitations of the vertical edger.

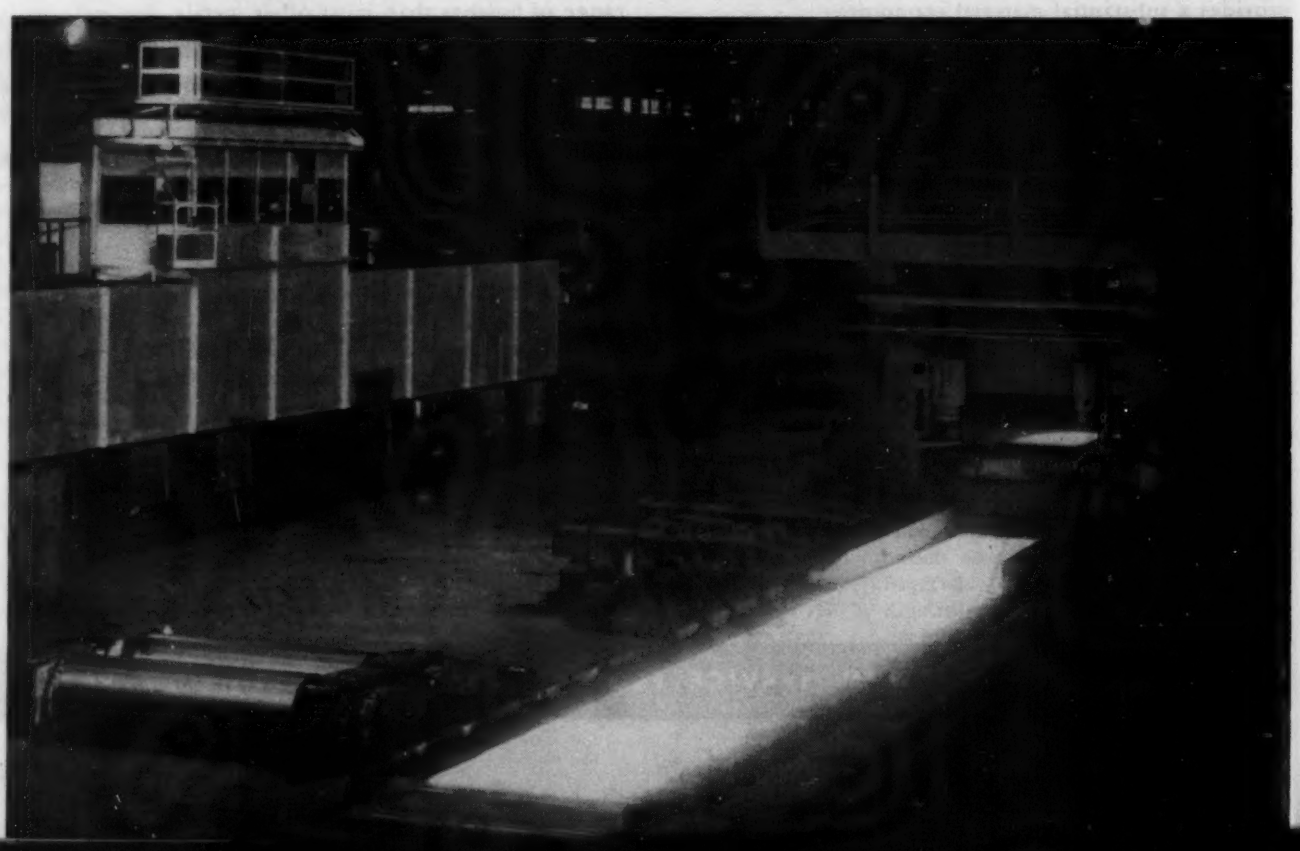
This is a motor-driven, crank-operated squeezer with screw-type, motor-adjusted pusher heads and hydraulically operated hold-down. It has a capacity of making a 3-inch penetration on a 4-inch thick slab 16 feet long. It operates on a start-and-stop cycle at the rate of 5 strokes per minute.

The head of the pitman side has a stroke of 7 inches. Heads are adjusted through two enclosed worm-reduction units and screws which operate through the center of the worm wheel. The eccentric shaft has a 3½-inch throw.

The hold-down is hydraulically operated and consists of two hold-down plungers and one pull-back plunger. Movement of hold-down plungers is equalized by means of rack and pinions and inter-connecting shaft.

An underdriven vertical edger is driven by a 600-

Fig. 11—Four-high reversing rougher at right, and control pulpit at left form part of the semi-continuous 100-inch plate mill at Homestead works of Carnegie-Illinois Steel Corp.



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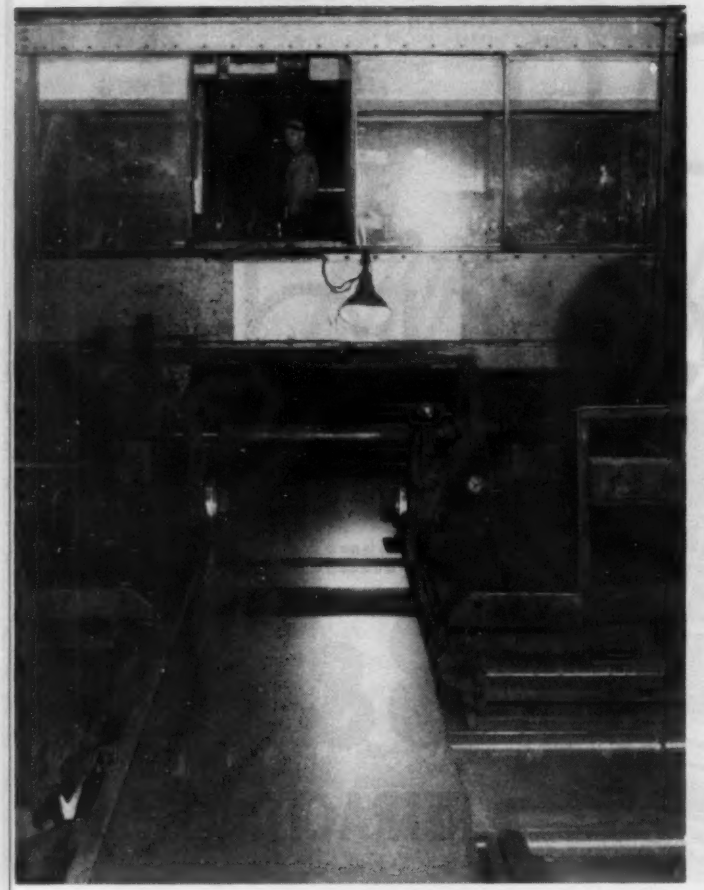

Fig. 12—Rotary trimming shear of the semi-continuous 100-inch plate mill at Homestead works of Carnegie-Illinois Steel Corp.

horsepower, 125 to 400 revolutions per minute, shut-wound, 700-volt, direct-current motor. Power is supplied to both rolls through a shaft fixed endwise and a bevel pinion, carried in roller bearings, that slides over long keys as the housing is moved in or out. Each housing is adjustable for width by a worm wheel nut. A rack-and-pinion-driven drum mounted on the stationary housing gives a reading for width. From the bevel pinion, power is carried through the bevel gear to a pinion with single helical teeth integral with the shaft. This pinion meshes with the gear on the vertical roll spindles. The edging rolls are mounted on a taper of this spindle shaft and held in position by tapered keys. This arrangement permits quick changing of rolls.

The reversing roughing stand is a four-high mill with work rolls 36 inches diameter, and back-up rolls 54 inches diameter by 120 inches body length. It is direct driven by a 7000-horsepower, 700-volt, 40/80 revolutions per minute, direct-current motor. Speed is from 377 to 754 feet per minute.

A series of three, five, or seven passes in this mill brings the slab to the desired thickness for finishing. Three sets of side guides service this reversing unit—one preceding the vertical edger, a second located between the vertical edger and horizontal rolls and the third following the horizontal rolls. Side guides and edger on the entry side of the mill are set to a dimension corresponding to the width of the slab being rolled, while those on the exit side are set 4 inches or more wider so as not to interfere with the steel leaving the rolls. These settings alternate automatically according to the direction of the steel going through the mill. They are connected to the automatic screwdown control.

The screwdown is operated by two 50-horsepower, 550 revolutions per minute, mill type motors through a reduction unit having a ratio of 15 to 1. Speed of screws is approximately 30 inches per minute. A magnetic clutch connects the two motors.

The screwdown is equipped with selsyn motors, with indicators mounted on the control desk in the operator's pulpit. These are operated to preset for draft.

After leaving the reversing rougher, a light secondary scale forms on the surface of the plate while it is moving towards the finishing stands. Just before the finishing stands, a pair of pinch rolls under spring pressure act as a light scale-breaker and form a dam against which water from a set of descaling sprays is prevented from being thrown up on the mill table. These descaling sprays operate at a pressure between 1000 and 1200 pounds per square inch to clean the plate before it enters the first finishing stand.

The finishing train consists of four stands of four-high, 27 and 54 x 100-inch mills. Each stand is driven through a pinion gear stand by a 500-horsepower, 600-volt, direct current motor, the first three at speeds of 110 to 250 revolutions per minute and the last at 125 to 265 revolutions per minute.

Delivery speeds of the finishing stands are as follows: No. 1, 333-760 feet per minute; No. 2, 440-1000 feet per minute; No. 3, 530-1200 feet per minute; and No. 4, 655-1386 feet per minute.

Since it is necessary to change the draft in the mill as the piece goes through the mill, the screwdowns are powerful. Gearing is at a ratio of 100 to 1. The speed of screws for stands No. 1 and 2 are ½-inch per minute, while the speed of screws for stands No. 3 and 4 are only 0.2-inch per minute. This speed compares with speeds as high as 35 inches per minute on mills where draft is adjusted with the piece out of the mill.

The finishing train is equipped with specially designed motor-operated guides and loopers. There is one of these units between each pair of successive stands.

One of the most modern semi-continuous plate mills in the United States is the 120-inch plate mill installed by the United States Navy at Lukens Steel Co. and placed in operation late in 1943. This new mill is so located that it can work in conjunction with a previously existing 112-inch mill which is used as a rougher. Outstanding characteristics of plates from the 120-inch mill are accuracy, uniformity of gage and smoothness of surface.

Rolling slabs or slab ingots 24 to 60 inches wide and 36 to 90 inches long, this mill produces plates ranging from 22 to 110 inches in width, up to 1½ inches in thickness and up to 80 feet long.

Heating facilities for this mill consist of four two-

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hole rows of recuperative pits and five side-door heating furnaces. The pits, 13 feet, 6 inches long x 12 feet, 6 inches wide x 10 feet, 6 inches deep, are fired with natural gas through two burners, placed near the top of the pit in diagonally opposite corners. Standby burners and equipment for burning fuel oil are also installed. Waste gases leave the pits through ports near the bottom of the side walls and pass through refractory tile recuperators which heat air required for combustion to temperatures averaging about 1200° F.

Each pit has automatic controls for temperature, fuel-air ratio and furnace pressure, and with an individual fan rated at 6000 cubic feet per minute at 6 inches water column pressure for combustion air. Fuel consumption averages about 1½ million Btu per ton.

Ingots are handled into and out of the pits by two 10-ton overhead pit cranes, while pit covers are handled by two cover mechanisms.

Of the five side-door heating furnaces, four are of modern recuperative design, completely equipped with automatic control, while the fifth is a regenerative unit which will be modernized at its next rebuilding. These furnaces range 26 to 34 feet in length, 8 to 10 feet in width and 4 feet, 8 inches to 6 feet 6 inches in height.

The side-door furnaces are also fired with natural gas and have auxiliary facilities for fuel oil. Fuel consumption averages about 2½ million Btu per ton.

These furnaces are served by a 5-ton charging crane, which deposits heated steel from the furnace directly upon the mill approach table. Steel from the soaking pits, however, is brought to the mill by a remote-controlled ingot buggy, which may also be used to carry breakdowns from the mill back to the pits for reheating.

An approach table 24 feet long and a tilting mill table hydraulically operated and 21 feet 3 inches long, lead to the 112-inch three-high roughing stand. Rolls in this stand have a body length of 112 inches, the top and bottom rolls having a diameter of 36 inches and the middle roll a diameter of 21 inches. Roll neck bearings are of bronze with forced feed lubrication. Rolls are hydraulically balanced and the middle roll is shifted hydraulically. A maximum roll lift of 17¾ inches may be obtained, the adjustment being effected by mill screws 11 inches in diameter with 1½-inches pitch and driven by two 50 horsepower motors.

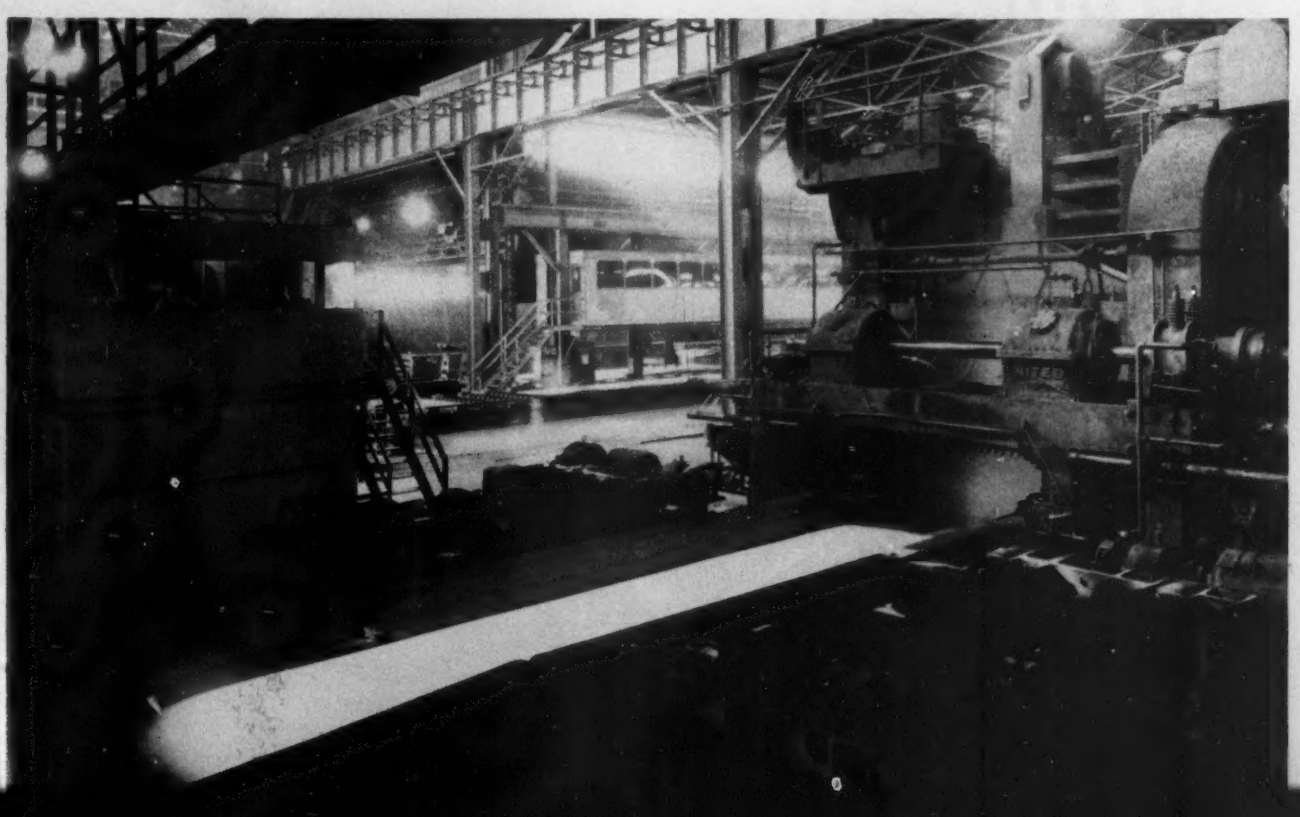
The 112-inch roughing mill is driven by a 3750-horsepower wound rotor induction motor, 2200-volt, 3 phase, 60 cycle; with gear reduction set 5.63 to 1; 2 flywheels 112 inches in diameter, 21,000 pounds; rim speed, 14,700 feet per minute; lead spindle 90 revolutions per minute.

Following the roughing stand at a distance of about 40 feet is a vertical edger which contains rolls 42 inches in diameter and of 28½-inch face. These rolls operate in bronze bearings lubricated by a circulating oil system. A maximum roll opening of 120 inches is available. The main drive, operating through bevel and herringbone gearing, is a 1250 horsepower, 600 volt, 70-210 revolutions per minute direct current motor, giving a rolling speed of about 170 to 510 feet per minute. Power for this motor comes from a 1000 kilowatt motor-generator set located in the 120-inch mill motor room. The edger acts to maintain uniform sides and reduce side scrap.

Located approximately 140 feet from the edging unit is the 120-inch mill, a four-high 36 and 54 x 120-inch unit with integral vertical edger.

The 120-inch mill is driven by a 7000-horsepower motor, 35-80 revolutions per minute; peak horsepower, 19,250. Direct drive connected through pinion gear. Direct current motor generator set 6000 horsepower; 13,200 volt, alternating current motor driving three

Fig. 13—Overall view of four-high 120-inch finishing mill at Lukens Steel Co.



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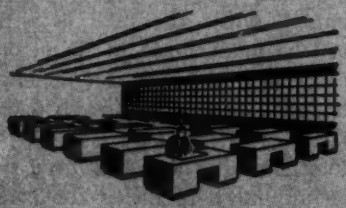

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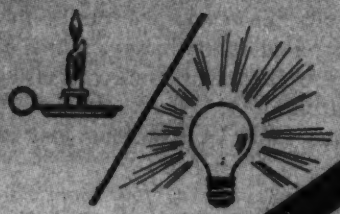

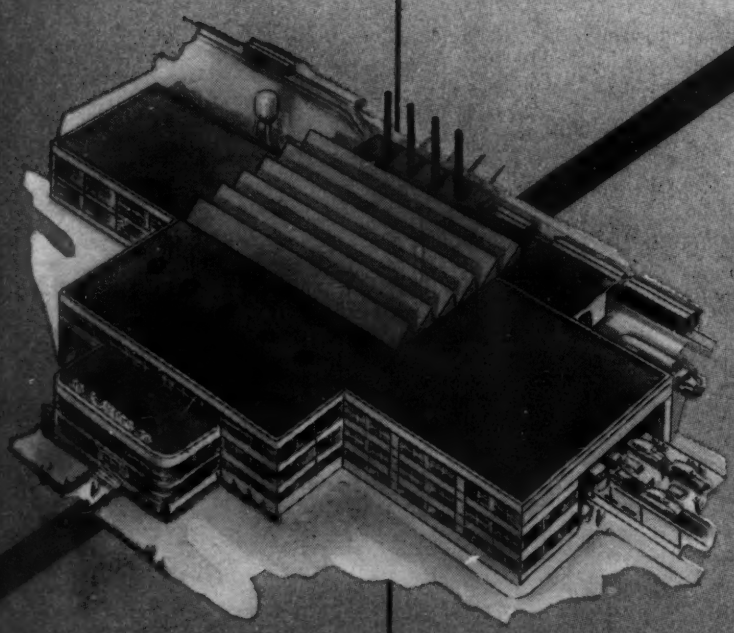

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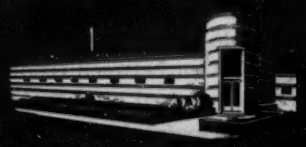

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Vertical rolls of 24-inch diameter and 10-inch face are driven by a 500-horsepower, 700-volt, 200-500 revolutions per minute direct current reversing motor. The vertical rolls are adjusted in a horizontal direction by two 25 horsepower motors. A maximum opening of 120-inches may be obtained. Rolling speed may be varied from 350 to 800 feet per minute.

Roller bearings are used for the necks of the work rolls in the mill and for the vertical edging rolls. Mill back-up rolls run in oil-flooded bearings.

Rolls in the 120-inch mill are balanced by an oil-hydraulic system. A maximum roll lift of 15 inches is available. Mill screws 20 inches in diameter and of 1-inch pitch are operated at a lift speed of 12 inches per minute by two 75 horsepower motors under magnetic contactor control automatically interlocked with other mill motions.

Under this control, the rolling schedule is set up on a switchboard by plugging cords into holes marked with the desired mill opening. It is possible to set up a rolling schedule with as many as 21 passes on this board, and there are two complete sets of plugs, allowing one schedule to be set up while the other is being rolled. In order to change from one schedule to the other, it is only necessary for the screwman to operate a small desk mounted pistol grip control switch. Actually, 5 to 9 passes are normally required, when finishing breakdowns from the 112-inch mill.

The automatic screwdown is interlocked with the front and back sideguards and the attached edger.

Fig. 14—Operator's pulpit of the 120-inch mill at Lukens Steel Co. Operation of the automatic control is by means of a palm-type, push-button switch located on the control desk. Finishing mill operator is assisted by a recorder who sets control board

With a slab in front of the mill, the front sideguards and attached edger are moved in to center the slab on the tables, and the back sideguards moved out to a position which will clear the piece when brought through the mill. The slab is then sent through the mill by operating the screwman's master foot switch controlling speed and direction of the main drive, attached edger drive, and front and back tables. Upon reaching the back of the mill, the slab is stopped and the operator presses an automatic screwdown push-button located on the desk. The roll opening automatically changes to the predetermined value for the second pass, the back sideguards move in to center the piece and the attached edger and front sideguards move out to a position which will clear the material when it comes through the mill. When the piece is in front of the mill and the screwdown button is pressed, the next pass opening is automatically reached, and the same action as above in the reverse direction takes place on the sideguards and edger. This automatic in-and-out stroke of the sideguards and edgers can be adjusted to any value between 0 and 5 inches.

Position of the screws on each side of the housings, each sideguard and each edging roll is indicated at all times by selsyn driven indicators on the screwman's desk.

Automatic action will only take place with all manual controls for each motion in the "off" position. The screwman can, at any time, perform any motion manually by operating its respective controller.

Mill pinions of 4.522-inch pitch, 60-inch face and 39-inch pitch diameter are connected to the mill by universal spindles 15 foot, 8½ inches long x 19½ inches in diameter.

Mill tables, which, with the exception of the 112-inch mill tilting tables, are equipped with roller bearings, and driven through bevel gears and line shafts by mill type motors. Front and back mill tables on the 120-inch stand (each 52 feet, 9 inches long) are operated under adjustable voltage control, with provision for draft compensation between front and back table speeds. Rollers are spaced on 3-foot centers.

Descaling is performed hydraulically by sprays located on the top of the back of the 112-inch breakdown mill. Both bottom and top sprays are located on the back of the 120-inch mill. Water pressure is maintained at 1300 pounds per square inch by two 1000 gallons per minute centrifugal pumps driven by 900-horsepower synchronous motors under automatic pressure control. A pneumatic accumulator, 4 x 40 feet, protects the system from extreme surges and swings. Removal of scale is greatly facilitated by the use of a spirally grooved or fluted middle roll in the 112-inch roughing stand. Mill scale is flushed from underneath mills and tables by 300 pounds per square inch flushing jets into two scale pits, from where it is removed by clamshell bucket and overhead crane.

Adjacent to the 120-inch mill is its motor room, in which is housed the main roll drive motor, the motor driving the integral edging rolls, required motor generator sets, exciters, control, switchgear, etc.

Approximately 130 feet beyond the 120-inch mill

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Kathy Lynn and Theodore Balash, as painted from photographs

She has a big stake in steel

Year-old Kathy Lynn of 3941 Kleber Street, Pittsburgh, Pa., is the daughter of Theodore Balash, successful plumber and a good customer of steel. More steel has helped his business double since V-J Day. The better his business, the brighter Kathy Lynn's future.

Not so long ago, plumbing fixtures were in short supply. Balash had one problem after another in meeting customers' needs. But today he and the two apprentices working for him are having it a lot easier. With record steel production, post-war shortages of fixtures and all other steel products are disappearing.

Kathy Lynn's stake in steel will increase with the years. When she has grown to earning and spending age, she will find life even pleasanter with things made possible by plenty of this basic metal.

To insure sufficient supplies for all the people, steel companies are spending two billion dollars in a continuing expansion program. Meanwhile, all records of production of finished steel are being broken. Last year with less than 7 percent of the world's population, *Americans had 53 percent of the world's steel output.*

Steel is a far-seeing, fast-moving industry. It will continue to provide increasing quantities of steel to everybody, from the small businessman like Theodore Balash to the largest user.

Steel works for EVERYONE

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Production of Plates

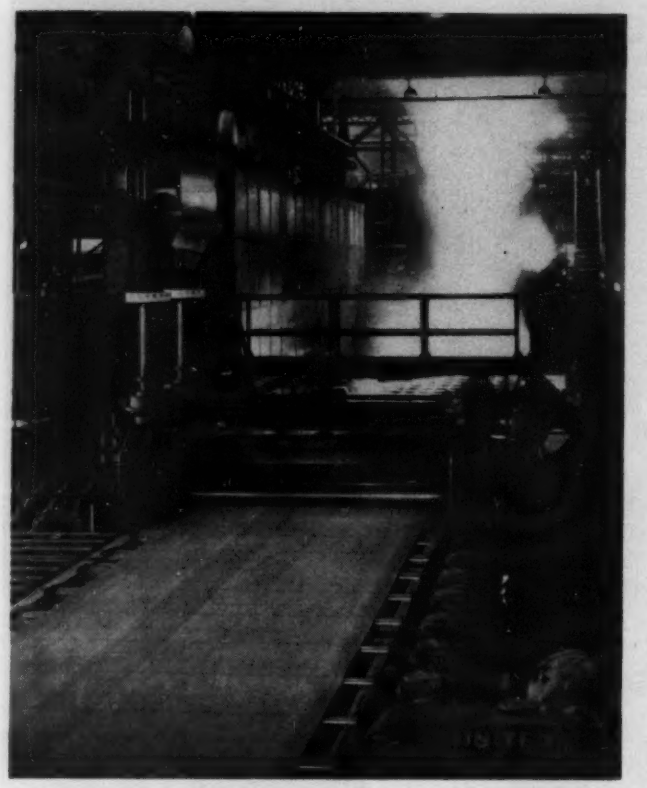

Fig. 15—Straightening rolls or roller-leveller which flattens the plate immediately after it leaves the 120-inch mill at Lukens Steel Co.

is a heavy-duty leveler containing eleven rolls 10 inches in diameter and 124 inches long, and capable of hot-flattening plate up to ½-inch thick. Leaving this leveler, plate may proceed down the runout table, which continues for about 300 feet, then over an 80 foot cast grid cooling bed to a parallel table which contains a nine-roll leveler with rolls 14 inches in diameter x 124 inches long, which can hot-flatten plates up to 1½ inch thick. The plate may then be kicked onto a piler or it may be taken over another 80 foot transfer to a third parallel table containing a turn-over device for inspection purposes, a marking station, three 156-inch gate shears, one rotary side-trimming shear, one 146-inch gate shear and one 120-inch gate shear.

One of the aforementioned 156-inch shears is used as a crop shear, while a second unit, 210 feet away, equipped with shear gage, is used for parting. Both of these units will cut material up to 1½ inch thick x 120 inches wide. About halfway between the two is a rotary trimmer which will shear material up to ¾-inch thick. Magnetic plate shifters position the plate properly for side trimming. Scrap-choppers automatically cut up the side scrap, which is chuted into scrap buckets.

This last shearing table leads either to a caster bed which contains another end shear and two side shears, or to another parallel table containing a scale table, where plates may me weighed and given a final inspection.

If the desired characteristics of the product necessitate heat treatment, plate leaving the leveler in the mill runout table is transferred over a 50 foot transfer to a table line which contains a three-zone continuous annealing furnace 11 x 123 feet, fired with natural gas, and a 13-roll leveler with rolls 8 x 124 inches for plates ⅛ to ⅜-inch thick. The heat treated plates are then carried over a 50 foot transfer back to the runout table and then over to cooling tables previously mentioned.

According to the type of mill on which they are rolled, sheared plate mill or universal mill, plates are classified as "sheared plates" and "universal plates". The sheared plate mill produces a plate with rough and uneven edges which must be cut on all sides to give a rectangular plate. This is accomplished with powerful shears or by flame cutting. Universal plate mills produce plates of ordered width, with straight and almost perfectly parallel rolled edges. However, since no cross rolling takes place on a universal mill, universal plate cannot be expected to have as high transverse properties as a cross-rolled sheared plate. Universal plates are satisfactory for structural work and for many purposes where a finished edge is desired without shearing or machining. There are also certain universal mill sizes which cannot be practically produced on a sheared-plate mill, as for example, a plate ⅜ x 8 x 500 inches. A plate of these dimensions which can be produced with reasonable tolerance on a universal mill would camber, bow or twist if attempts were made to produce it on the sheared plate mill.

Principal steel plate qualities usually covered by typical specifications are hot pressing and cold pressing steel, flange and firebox steel, structural steels, copper bearing steels, drawing quality steel, forging quality steel, boiler steel, hull steel, still bottom steel and killed-steel quality.

Plates are classed as carbon steel when no minimum content is specified or guaranteed for aluminum, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium or any other element added to obtain a desired alloying effect; when the specified or guaranteed minimum for copper does not exceed 0.40 per cent; or when the maximum content specified or guaranteed for any of the following elements does not exceed the percentages noted: manganese 1.65, silicon 0.60, copper 0.60. (AISI, Steel Products Manual).

Commercial grades of low-carbon steel for plates are covered by the stadard specifications of American Society for Testing Materials (ASTM), American Society of Mechanical Engineers (ASME), American Railway Engineering Association (AREA) and the Association of American Railroads (AAR).

Plate mills of today are used for rolling plates of carbon and alloy steels and nonferrous materials such as copper, nickel, brass and aluminum. They are also used for plate specialties including composite materials such as "clad" steels, composite armor plate, and rolled steam platens; heavy rolling pressures on the composite materials reduce their thickness uniformly and pressure-weld the components into inseparable plates.

Clad steel was a pioneering effort of Lukens Steel Co. in collaboration with International Nickel Co.

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Westinghouse Life-Line Motors

Production of Plates

In 1930, the first nickel-clad steel plate was rolled for the economical construction of a corrosion-resistant tank car for transportation of iron-free caustic soda, the 10 per cent cladding doing the work of solid corrosion-resistant nickel plate. Today, substantial savings in material costs result from the use of clad steels instead of solid corrosion-resistant metals in the process industries, and equipment once subject to corrosion is given longer service life.

Clad steel plates, produced by our hot rolling method, consist of a light layer of cladding metal—nickel, stainless (of various types), Inconel or Monel—permanently bonded to a backing plate of ASME or ASTM specification steel. On occasion, too, steel plates are clad with silver for highly specialized commercial applications. Plates are also rolled with cladding on both sides.

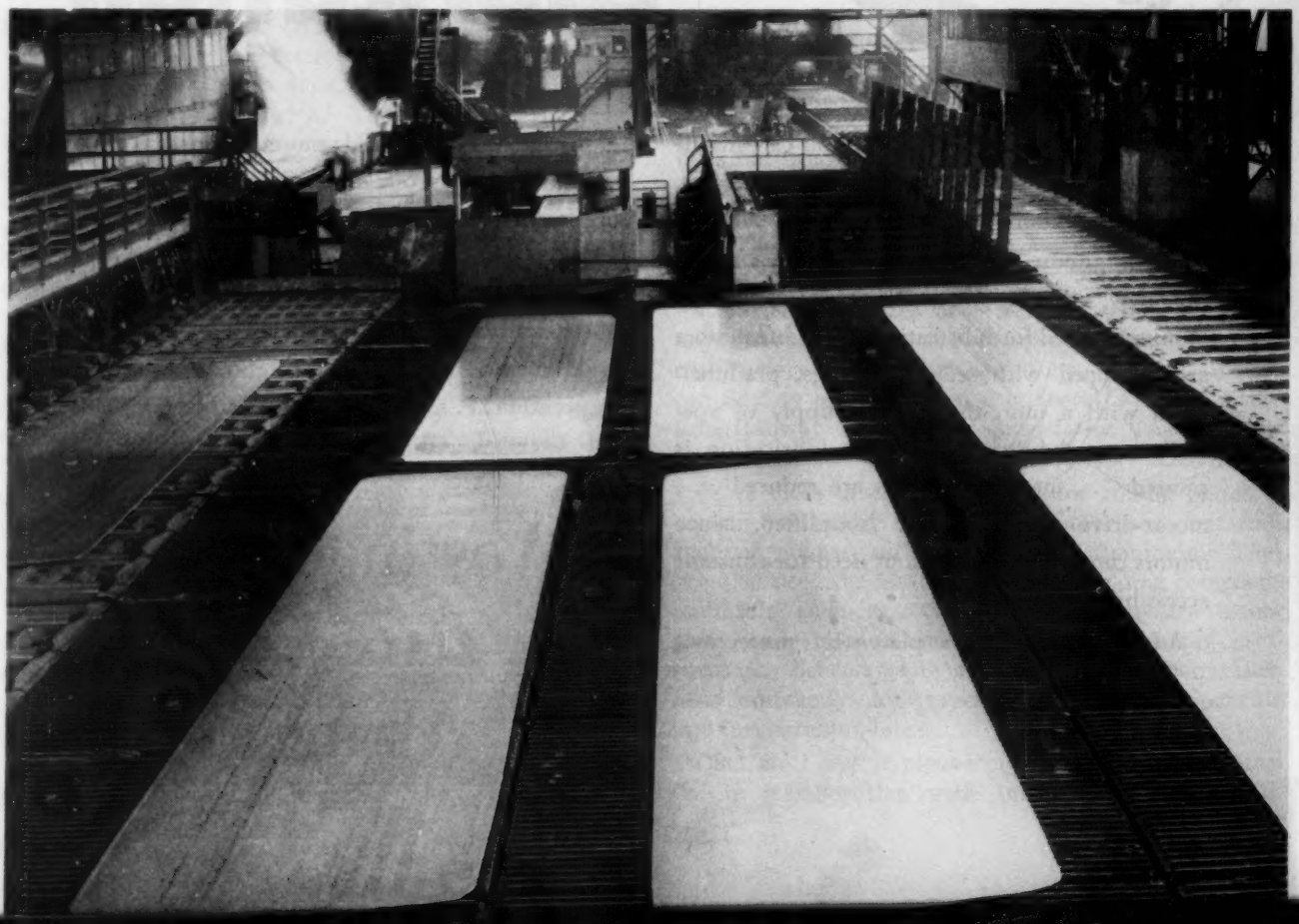
In manufacturing clad plates, components are initially processed to prepare them for assembly, first by cleaning the individual surfaces to be bonded, then, if stainless or Inconel, by electrolytic nickel plating of one side to insure a good bond. (Stainless steel and Inconel oxidize too quickly to bond directly to steel without being nickel plated.) Nickel is not readily oxidized, is soluble in steel in all proportions, and has been found to be the most satisfactory of all materials used for this purpose, acting as a buffer to carbon migration from the backing steel, and assuring greater bond strength and, therefore, better heat transfer properties in the clad plate.

After the components have been fully processed according to requirements, they are assembled in a pack or "sandwich." Precise control is exercised over the proportions of the components which make up this assembly. A plate of the specified cladding material, with one surface specially prepared, is placed on a steel slab. Then a second similarly prepared assembly of steel and cladding material is placed on top of the first one with the corrosion-resistant metals touching, only separated by an infusible parting compound. The steel backing plates, top and bottom, are made slightly longer and wider than the cladding plates so that, after the four-layer pack, or sandwich, is formed, there is a groove running around the four sides of the assembly. Bars are used as fill, in the sides, between the slabs, to make welding possible on an automatic welding machine. Welding completely seals the pack to prevent contamination and movement of the components during subsequent heating and rolling.

The composite pack is heated in a soaking pit to a temperature of 2100 to 2350° F, depending upon type of cladding, and rolled on a mill. Heavy rolling pressure on the composite material reduces its thickness uniformly and permanently bonds the cladding to the steel, maintaining the same relative proportions from the assembly to the rolled clad steel plate. After rolling, the pack is sheared or flame cut inside the weld edges and then separated into two clad steel plates, each of which consists of a steel backing with a layer of the clad metal permanently bonded to one surface.

Clad steel plates are now being descaled by the sodium hydride process. The plate is immersed in a bath of molten caustic soda at 700° F which contains (1.2 to 1.7 per cent sodium hydride) produced by the reaction of sodium and hydrogen. The sodium hydride reduces the scale to metal or lower metal

Fig. 16—*Modern cooling bed showing turnover device for thorough rapid inspection of plates is shown at right rear*



oxides. The plate is then cooled by water quenching, during which the steam generated helps blast loosened scale from the surface. Subsequently the clad surface of the plate is brightened by immersion in an acid bath. After a holding bath in water and high-pressure spraying, plates receive a hot water bath from which they dry quickly. Plates, heads and parts are descaled by this method which removes all scale without loss of metal. Surface of clad steel plates and other materials descaled by this method is smooth, easy-to-keep clean, and free from scale.

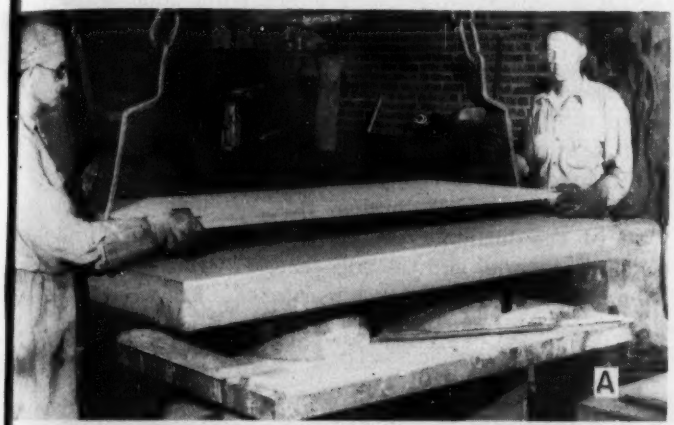
Mechanical properties of the composite clad steel plate, as determined by tensile test, are equal to or better than tensile strength of A-285, Grade C, steel.

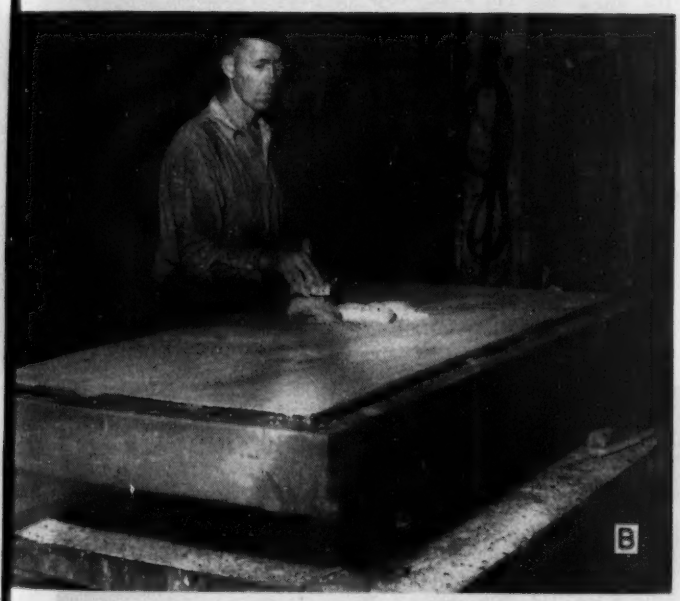
The backing plate is generally carbon steel, but may be any low-alloy steel of flange or firebox quality conforming to ASME, ASTM, AAR or other standard plate specifications. Values are based on the minimum mechanical properties and chemical requirements of ASTM steel specifications in general use for the backing plates of corrosion-resistant clad steels.

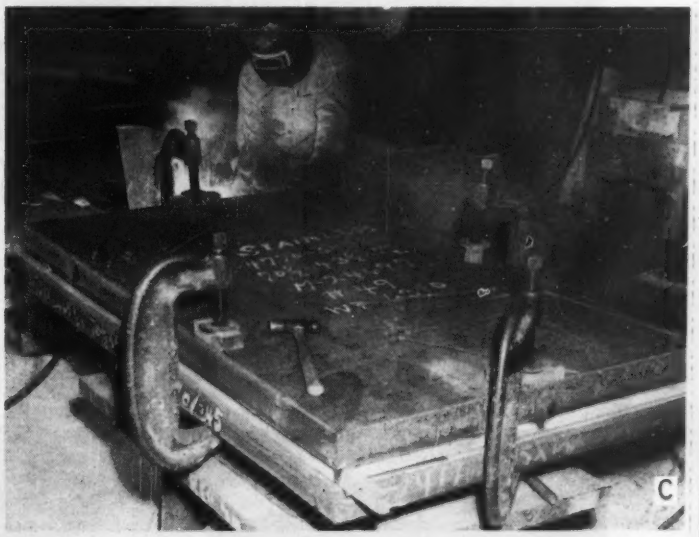
Because of the wide range of selection of backing material, advantage can be taken of the high tensile strength of carbon-silicon or low-alloy steels, or the elevated or sub-zero temperature properties of molybdenum or nickel steels, respectively.

If special analyses are required for backing steels for which no standard specification is available, agreement may be reached between the purchaser and the manufacturer.

The corrosion-resistant metals used as cladding are







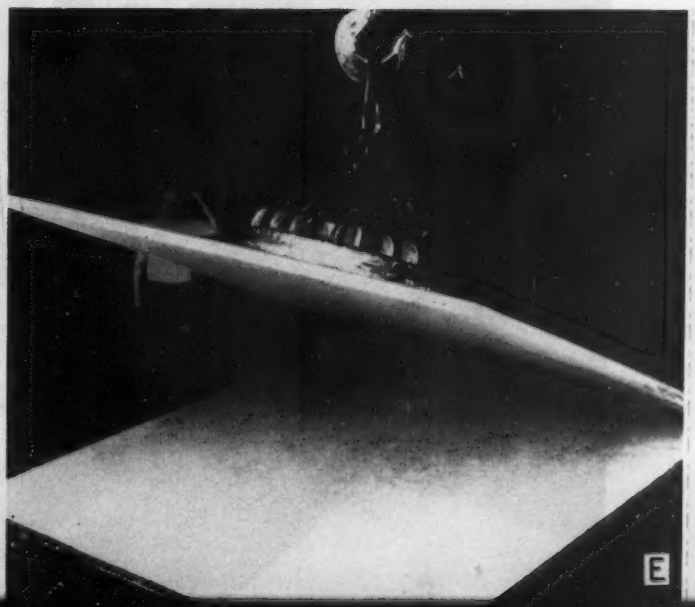


Fig. 17—Some of the steps in manufacture of clad steel plates at Lukens Steel Co.: A—assembling the cladding insert and steel backing plate, B—applying parting compound to one-half the assembly, C—tack welding the assembly before heating and rolling, D—rolling assembly on 206-inch plate mill, and E—separating the rolled pack into clad plates

homogeneous and dense in structure and are unchanged in any way by being bonded to steel.

Nickel-clad, Inconel-clad, Monel-clad and stainless clad (type 405, 410, 430, 304, 216, 347) are the corrosion-resistant clad plates regularly made by our organization.

Cladding thickness is normally specified as a percentage of total thickness of the composite plate. The most common thicknesses are 10 and 20 per cent, but it may vary from 5 to 50 per cent. Cladding thickness may also be ordered in fractions or decimals of an inch, such as 7/64, 0.050, etc., regardless of the composite plate gage.

Both sides of the backing plate may be clad with corrosion-resistant material for uses such as vessel partitions. When certain unusually corrosive conditions are found, double clad plate consisting of nickel on one surface and Inconel on the other surface of carbon steel backing plate, for example, can be produced.

The thickness of cladding is determined by requirements of the application, but for commercial fabricating reasons, it is generally held to 0.030-inch minimum.

Precision assembly and the high, uniform rolling pressure employed to reduce and bond components give control over the uniformity of cladding thickness. Through precise control of the ratio of thickness of cladding inserts to backing steel slabs in assembly of the clad metals prior to rolling, and as two or more clad plates are obtained from the same assembly, the relative proportions of cladding to backing in the finished clad steel plate are maintained with constancy and uniformity.

Fig. 18—*Modern* 1000-*ton stretcher-leveller for special light gage alloy and clad steel plates recently installed at Lukens Steel Co. This unit can handle plates up to a maximum size of* 362 *x* 132 *inches, and from* 5/16-*inch maximum gage to any desired lighter gage*

Bond, or adhesion strength, of clad materials is formed, as stated earlier, by pressure welding at high temperature on a rolling mill. The use of nickel plating on all cladding materials containing chromium assures high bond strength, and acts as a buffer to carbon migration from the backing steel. As nickel is soluble in steel in all proportions and is not readily oxidized, the bond is completely homogeneous throughout the entire area of the clad steel plate.

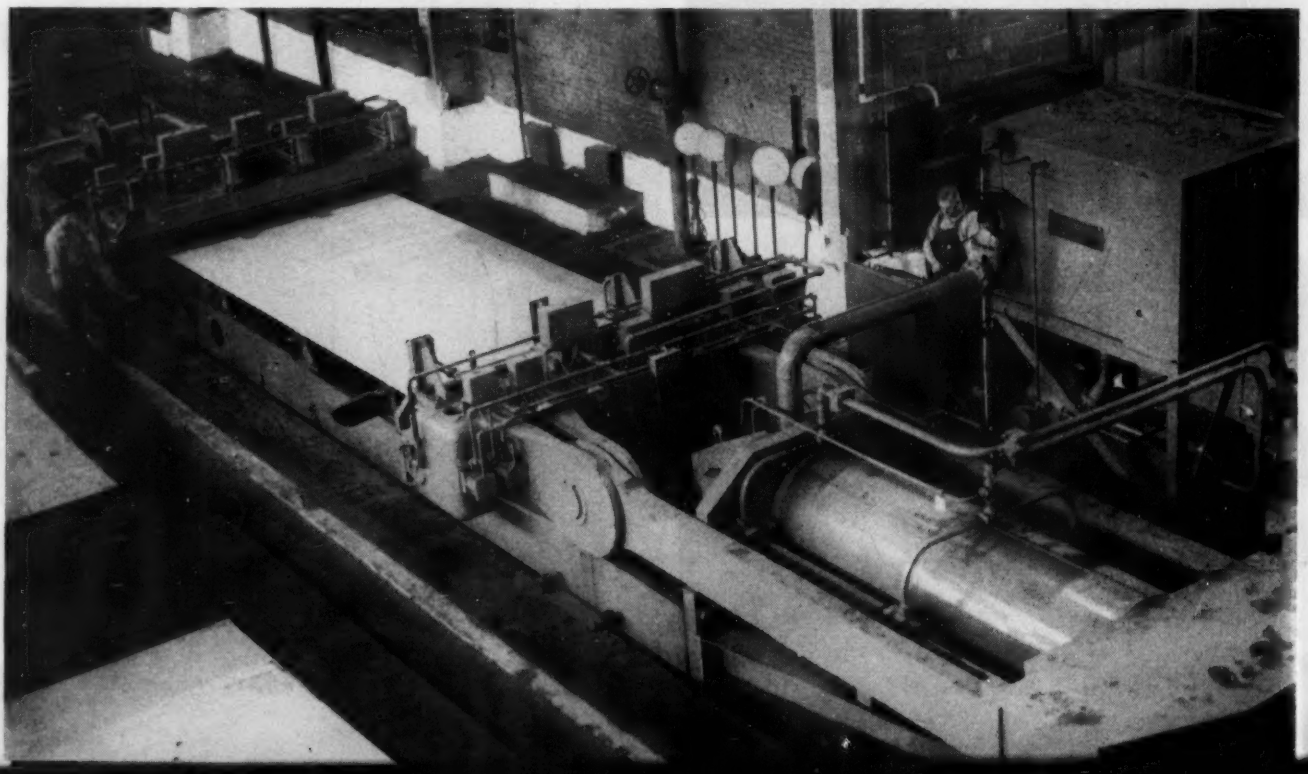
Clad steel plate specimens, when subjected to shear strength tests, have sustained pressures of over 40,000 pounds per square inch, average, showing the high bond strength. ASME boiler code and ASTM specification requires a minimum bond shear strength for clad steels of 20,000 pounds per square inch.

Vessels made of clad steels (with the exception of nickel-clad steel which corresponds to solid nickel's high heat conductivity) have a great advantage over solid corrosion-resistant materials or lined vessels because of clad steel's higher rate of heat transfer. Due to the intimate contact between cladding and backing material and the adherence of the bond, there is no significant thermal resistance. Efficiency in heat trasfer properties of clad steels is almost equal to that of solid carbon steel.

Clad steel plates are available up to 178 inches wide and to over 3½ inches thick. As width extras for clad materials are low in proportion to fabricating costs, selection of the widest possible plates will result in maximum economy in cost, labor and production time in the fabrication of clad steel vessels. With clad steels, the widest applicable plate should always be used; all known examples show savings.

In ordering plates, thickness may be specified to a fraction or decimal of an inch, or to weight in pounds per square foot.

For boilers or other applications where stresses or strength are important, plates should be ordered by



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thickness, and not by weight. It is not possible to deliver the exact thickness desired because of variations in temperatures, shrinkage after rolling and other circumstances and specifications should allow some deviation from the exact thickness ordered. Over-thickness tolerance is regulated by the permissible allowable tolerance of over-weight. Under-thickness tolerance cannot be more than 0.01-inch of the specified thickness. Specifications to a closer tolerance range may be accepted under certain conditions by special arrangements. On plates ordered to a fraction, or decimal, the permissible variation in weight tolerance may be specified to be on the over side. Even if a plate is finished 0.01-inch under edge thickness, it could weight more than the theoretical weight because of crown through the longitudinal center.

For tanks where pressures are slight, or on work where an approximate thickness is permissible and the weight of the material is important, steel plates may be ordered by weight. The edge thickness will be slightly less than the theoretical equivalent. A mill takes responsibility for weight only, not thickness. To obtain a desired average weight over the entire plate, the mill will strive for an edge thickness slightly under the theoretical gage. The permissible tolerance allows a variation over and under the theoretical weight but does not provide a specific thickness.

Plating on Magnesium

(*Concluded from Page* 58)

transfer can be made to a standard plating bath. Simple parts do not require a high initial current density, while with deeply recessed parts it may be necessary in some cases.

In copper strike bath No. II which is an all potassium salt containing solution designed especially for plating over the zinc immersion coating, the fluoride tends to inhibit any possible chemical pitting as well as assist in producing smooth deposits.

Step XI—Transfer to Standard Plating Bath—Heavier bright copper deposits may be built up by transfer to standard proprietory copper plating baths. Nickel may be applied from any of the conventional baths, after copper plating, however, it is preferable that at least 0.0005-inch minimum thickness of copper be applied and that the nickel bath used have a pH of about 4.0 or above. Cadmium and zinc have been applied directly over the zinc immersion coating from the standard cyanide solutions.

Brass may be applied either directly to the zinc immersion deposit, from a standard cyanide bath, or after the initial copper strike. Silver may be applied from the conventional cyanide bath, after the initial copper strike, but it is preferable to plate heavier copper and apply a nickel strike, before silver plating to obtain the best adhesion to the copper itself. Copper-nickel-chromium composite decorative coatings may be readily applied. Finished parts of this type are shown in Fig. 2. Fig 3 shows the application of the copper-nickel-chromium plated finish to a typical die cast magnesium product.

Racking Parts to be Plated—Conventional plating racks properly insulated with organic coating materials are recommended for use in the new method for plating on magnesium. The racks should be given a copper strike on exposed areas before use and then used only for copper plating or given a copper strike after each cycle, when used in electroplating metals other than zinc or cadmium.

The copper takes a zinc immersion coating when in electrical contact with magnesium. The undesirable cell action which takes place with certain metals, other than copper, is averted, thereby insuring the production of a satisfactory pretreatment coating at places adjacent to the rack contact points.

Barrel Plating—Barrel plating provides an economical method of finishing small magnesium parts, such as screw machine products and the like, that have previously been difficult, or impractical to electroplate in any other manner.

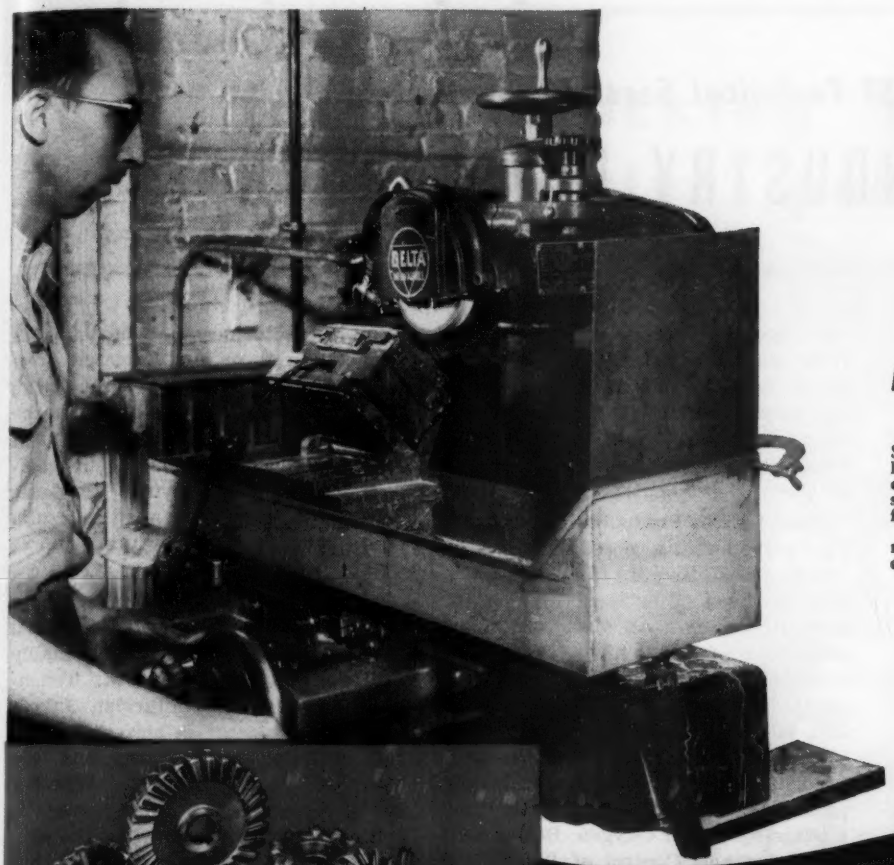
Recent pilot plant tests carried out by Dow show that small magnesium parts can be readily batch-processed by barrel plating methods such as used on other metals. Copper, copper-nickel and black nickel deposits have been applied in a conventional plating barrel. It is reported that bright barrel plated nickel, followed by rack chromium plating, is possible without the necessity for buffing the nickel before chromium plating. No difficulty was encountered in scratching the thin zinc coating, or loss of electrical contact, when copper striking the zinc coated parts. Lack of scratching of the electrodeposits during the plating operation can be explained on the basis of the lightness of the load as compared to equivalent batches of heavier steel parts. In this procedure, the zinc coating is best applied in a plating barrel that is revolved slowly or intermittently, during the treatment. The barrel must be insulated electrically from the tank to insure proper zinc coating formation.

Adhesion and Corrosion Resistance—Adhesion of the electrodeposits on magnesium articles is reported to be satisfactory. Plated wrought products have withstood heating to the melting point of the magnesium alloy (1100 to 1200° F) without a general lifting or blistering of the deposits. Cast parts will withstand heating to 450° F and higher, depending upon the quality of the castings in respect to porosity, etc.

Dow reported that copper and silver plated surfaces can be readily joined by soft soldering without disrupting the adhesion. Deposits will withstand deformation by hammering and bending without failure. Heavy chromium plates have been applied to articles for wear resistance tests. Deposits of 0.005-inch thickness have been applied without a tendency for a peeling of the deposits, even on high current density areas.

Salt spray tests on copper-nickel-chromium deposits withstand 48 to 168 hours in salt spray without failure, the time of exposure before initial failure depending on the thickness of the deposit. Thickness of the nickel deposit varied from 0.0005 to 0.0015-inch in these tests.

Dow corrosion test results report that no failure has occurred on copper-nickel-chromium plated parts on rural exterior exposure tests after 6 months. In this test the thickness of the nickel was varied also from 0.0005 to 0.0015-inch and the test is still in progress. Copper-nickel-chromium plated parts such as handles for file cabinets etc., have reportedly been exposed in the Dow laboratory atmosphere for 2 years with no indication of corrosion or blistering of the plate. In connection with corrosion testing it has been found that in tests such as salt spray, when failure in the plating starts as a localized area, the corrosion does not spread rapidly between the plate and the magnesium surface, whereas general lifting of the plate has been noted in other platings on magnesium where inferior adhesion of the plate has been experienced.



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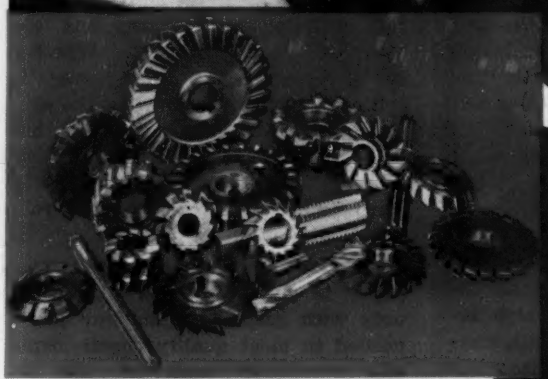

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AISI Technical Sessions Evaluate

STEEL INDUSTRY DEVELOPMENTS

PALM oil substitutes for hot dip tinning, increasing of finished steel production with existing equipment, metallurgical slag chemistry and effect of sulphur on quality and end uses of steel products were among the subjects of papers presented before the technical sessions of the general meeting of the American Iron and Steel Institute in New York, May 25 and 26. The following are brief summaries of some of the papers:

More Finished Steel—An increase in amount of finished steel products can be accomplished with or without an increase in quantity of steel produced by the steelmaking units. This statement was made by R. F. Passano, metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa., in his paper, "Finished Steel Production; Possible Increase From Existing Equipment". If it were physically impossible for steelmaking units to produce even one additional ton of steel in the ladles, quantity of steel products available to the trade could still be increased by a substantial amount by producing more product and less home scrap per cycle through the operations.

Heating, an essential step in every hot rolling operation, contributes to scrap because it causes scale formation. If one heating operation can be eliminated, loss that goes with it can be converted to potential product.

Recounted in the paper were practices that decrease the loss between ladle and the finished hot rolled products, such as having enough molds available for the ladle, having the small molds at the end to eliminate butts, etc.

In 1948, United States produced 65,973,138 tons of steel products from about 88,250,000 tons of ingots. Difference of nearly 22,280,000 tons was partially lost; some was cinder and scale, but the majority was home scrap which recirculated in the plant. A yield increase off the roughing mills, and off the finishing mills could convert some of this home scrap to products without change in production of steel ingots. The author also pointed out that if all operating hours of a roughing mill are scheduled and there are still ingots to be rolled, it could be arranged to roll two ingots at a time, the time lost from gainful reduction of the ingots as the rolls are moved from one rolling position to the next being spread over two ingots instead of one. The result would be a production increase of about 20 per cent.

Open Hearth Production Increase—In recent months, possibility of decreasing heat time by the use of oxygen has been of extreme interest to steel producers. As always true of suggested revolutionary steps in steelmaking, there have been exaggerated claims and excessive optimism, stated Erle G. Hill, director metallurgy and development, Wheeling Steel Corp., Wheeling, W. Va., in his paper "Increasing Open Hearth Production by use of Oxygen, Better Refractories and Control of Slag".

Two distinct uses for oxygen noted are for speeding combustion of the fuel and for oxidizing the carbon in the bath. Accelerated oxidation has the advantages of more rapid carbon drop which saves time and an increased bath temperature which increase fluidity of the slag with consequent savings in fuel. Disadvantages include generation of fumes, splashing of slag which may erode the roof and front wall and interference with charging floor operations.

Use of oxygen for decarburization is most prevalent in shops making low carbon steels. Production increase reportedly is from 12 to 15 per cent. For the same weight of fuel burned, use of oxygen diminishes quantity of products of combustion, thereby increasing flame temperature and decreasing amount of heat carried out by outgoing gases.

It was brought out that one of the most difficult tasks of the open hearth operator is to prevent loss of production by failure of refractories. Use of oxygen may shorten the campaign life but, by producing greater tonnage per hour while operating, the production lost by extra rebuilds may be offset. Silica brick, universally used in open hearth construction for years, has the property of withstanding loads at open hearth operating temperatures without deformation. This offers one means of improving open hearth roof life.

An alternative is the use of basic brick, refractoriness of which is well above present or contemplated open hearth temperatures. These bricks are inherently very resistant to the fluxing action of basic slags. Mr. Hill stated that at least four companies are now trying all-basic bricks, but whether or not the results will show a saving per ingot ton is still an open question.

Sulphur's Effect on Quality—Specific effects of sulphur on individual properties of steel are reasonably well established, stated M. Tenenbaum, research metallurgist, Inland Steel Co., Chicago, in his paper, "Effect of Sulphur on Quality and End Uses of Steel Products". Whether the effect of sulphur on any grade is critical depends not only on the specific properties being considered, but also on the balance of the steel analysis and the actual practices used in the manufacture, reheating and rolling of the product.

An attempt has been made in this paper to survey various steel products with respect to sulphur limits needed to meet quality requirements and to indicate manner in which the influence of sulphur is felt.

Data on which this paper is based were submitted by 26 steel plants. They indicated that small variations in sulphur content can and probably do exert a significant effect on product quality. The small variations in specified values often can hardly be justified on the basis of the apparently limited information available regarding the effect of sulphur on quality. The confused situation in which the effect of small sulphur variations does not seem satisfactorily defined, is particularly pronounced in the case of the commercially important steels for deep drawing applications. Because of the high cost associated with the elimination of a few thousandths of a per cent of sulphur as the specified limit for deep drawing steels is approached, logical and reliable data should be sought on which to establish specifications. Data relating sulphur to quality variables and the number of steels surveyed are obviously limited.

Much of the information gathered is based largely on individual opinion or on considered estimates. The

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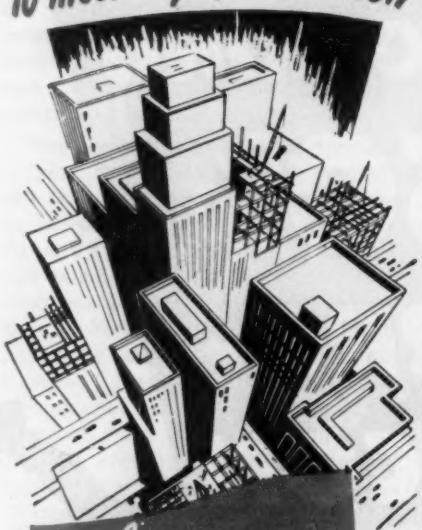

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data, however, can be used to demonstrate general nature of present knowledge regarding this problem and also can serve as a basis for directing future experimental investigations into the true role of sulphur in the metallurgy of steel.

Control of Sulphur—In their paper, "Studies Relating to the Control of Sulphur in the Production of Pig Iron", Truman H. Kennedy, general superintendent and Arthur W. Thornton, division superintendent, blast furnaces, open hearth and bessemer and rolling mills, National Tube Co., McKeesport, Pa., brought out that early efforts to avoid the effect of sulphur on blast furnace operations were directed toward the selection of raw materials. From the furnaceman's point of view, the scarcity of low-sulphur metallurgical furnace coal has been aggravated by the mine operators' struggle with increasing labor costs and the consequent trend toward increased coal mine mechanization. The mechanical loader, being unable to distinguish between coal and slate, has not improved the quality of the product of the coal mine.

To combat the trend toward higher ash and sulphur in metallurgical coals, many operators have resorted to beneficiation of coal by washing. However, beneficiation, in many instances, is but a means of utilizing what might otherwise be unsuitable coals and is of little comfort to most furnace operators.

Prospect of using coke containing even higher sulphur than the present makes the problem of sulphur elimination a vital one, since it is conceivable that the competitive position of a blast furnace plant may depend upon the ability of the operator to cope with this situaion.

If uniformly low sulphur iron is expected, any increase in sulphur entering the blast furnace requires a corresponding increase in slag volume and/or basicity. Increased basicity is to be preferred to increased slag volume, providing the proper slag fluidity can be maintained.

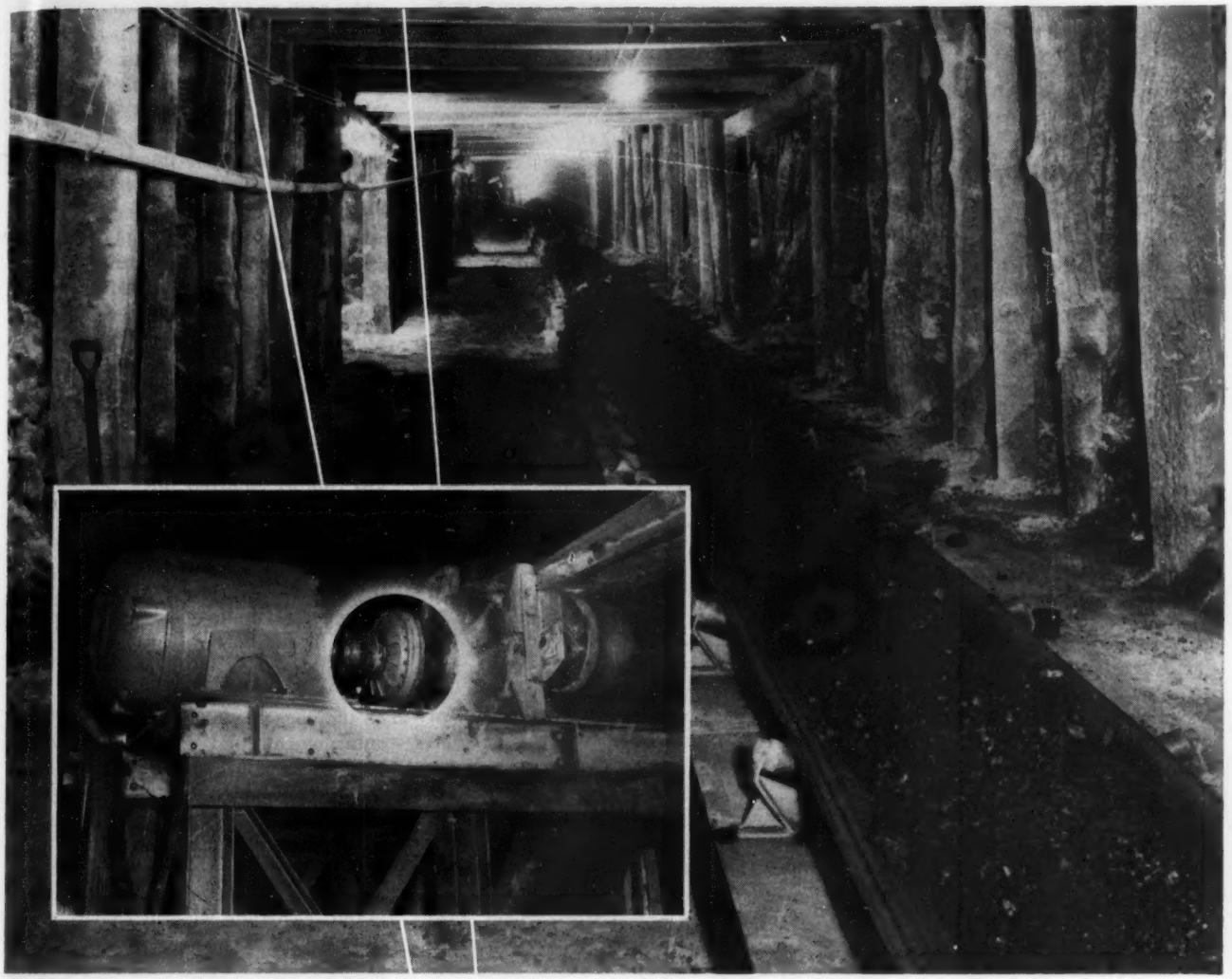
Depends Upon Basicity—According to N. J. Grant, associate professor of metallurgy and John Chipman, professor of metallurgy, Massachusetts Institute of Technology, the chemistry of slags is dependent, to an important extent, upon a property called the basicity. In their paper, "The Chemistry of Metallurgical Slags", it was pointed out that there is no clear cut definition of this term available and for this reason various ratios of slag concentrates have been used as approximate measures. As useful as any of these V-ratios is the "excess base" which is defined as the uncombined base ($CaO+MnO+MgO$) after neutralization of each mol of SiO_2 or Al_2O_3 with 2 mols of base, each mol of P_2O_5 with 4 mols of base and each mol of Fe_2O_3 with one mol of base (based on mol fraction calculations).

Methods for slag analysis include the usual wet chemical procedures, petrographic and spectrographic measurements. Improvements in spectrographic technique have shortened the time required and are expected still further to reduce it. Thus, it is possible to use spectrographic analysis not only as a research tool but also as a means for slag control during the making of the heat.

Several methods for estimating lime-silica ratios or other indices of basicity are available. These include slag pancakes and viscosity measurements applicable under special conditions and an improved and speedier means of petrographic estimation. Measurement of the pH or of the electrical conductance of an aqueous extract of the powdered slag also have been used as a measure of excess lime.

Core Wire and Electrodes—Pairs of rimmed and capped steel core wires from the same heats produced wire of comparable welding characteristics. The most important single core wire variable which affected the operating characteristics of covered electrodes was the average sulphur content, according to the paper, "The Influence of Core Wire on the Characteristics of Low Carbon Steel Welding Electrodes", presented by D. C. Martin, C. B. Voldrich and P. J. Rieppel, of Battelle Memorial Institute, Columbus, O. Sulphur contents of more than 0.040 per cent caused the electrodes to have deficient operating characteristics and severe weld pitting tendencies. Sulphur contents of between 0.030 and 0.040 per cent produced electrodes which had severe weld pitting tendencies, but acceptable operating characteristics. The best results were obtained with core wires which had an average sulphur content of about 0.030 per cent or below.

The type of steel in the core wire or in the base plate and the location of the core wire in the heat had no discernible influence on weld metal strength or ductility. None of the covered electrodes produced welds with excessive internal porosity, regardless of the core wire steel type, location of the core wire sample, or the coating used. In general, it might be said that there was practically no porosity in any of the groove or fillet welds, with the exception of the vertical down fillet welds which were made under rather abnormal



Taming a River of Coal . . .

From 85 feet below the surface of the earth to the top of a mine tipple, this 500 foot conveyor system carries more than 2800 tons of high-grade bituminous coal every day.

Taming this river of coal on its long journey upward is the job assigned to a Twin Disc 14 inch steel Hydraulic Coupling. Designed and built by the Joy Manufacturing Company, the Coupling-equipped belt conveyor system was recently installed in the Midvale, Ohio, mine of the Columbia Division, Pittsburgh Plate Glass Company.

The Twin Disc Hydraulic Coupling, with no metal-to-metal contact between the power source and the conveyor, cushions the jolting caused by intermittent loading and starts and stops . . . eliminates the greatest threat to conveyor belts and drive mechanism. As in most Hydraulic Coupling installations, a general purpose motor, rated for the running horsepower requirements of the conveyor operation, is utilized. Due to the slip characteristics of the Twin Disc Coupling, over-motoring for starting purposes is unnecessary.

For complete information on how these Twin Disc Hydraulic Units can be applied to your power transmission problem, write the Hydraulic Division for Bulletin 136. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

welding conditions, it was reported.

Operating characteristics of the test electrodes were affected in greater degree by the type of coating used than by the characteristics of the core wire. The exception is core wire with an abnormally high sulphur content in which case the core wire exerted a somewhat stronger influence on welding characteristics.

Palm Oil Substitutes — Approximately 7500 tons of palm oil are consumed annually in making hot dip tin plate in the United States, said W. R. Johnson, research metallurgist, L. C. Kinney, supervisor of chemical engineering and John M. Parks, supervisor of nonferrous metallurgy, Armour Research Foundation, Chicago, in their paper, "Palm Oil Substitutes for Hot Dip Tinning".

Palm oil has several deficiencies. Its flash and fire points are low enough to create a fire hazard; it is volatile at tin pot temperatures, and tends to increase in viscosity with time at tin pot operating temperatures. A primary disadvantage is its foreign source, and the strategic and financial problems which thereby arise.

New or fresh palm oil is not suitable for a tinning oil. It must be heated at pot temperature first or mixed with old palm oil. Tinning oil dragout increases with higher operating speeds, lower coating weights, and rougher sheet surfaces. It is a difficult problem to formulate or discover a radically different oil which will take the place of palm oil, doing an equivalent or better job, in equipment specifically designed for palm oil.

Satisfactory tin plate can be made with 100 per cent free fatty acid, if the acid is not too volatile or viscous. It is believed that there is a good possibility of finding a synthetic tinning oil which will be superior to palm oil in strategic availability, performance, and cost, although such an oil may require some modification in tinning procedures and equipment. In addition, the possibility of replacing African palm oil with some of the natural occurring Latin American vegetable oils awaits only the development of plantations and extraction facilities.

Oxygen Distribution—Among the most important reactions encountered in steelmaking is that occurring in molten iron between dissolved silicon and oxygen. This is a refining reaction in the bessemer and open hearth processes, and is also involved in the deoxidation of most grades of steel. In the latter case, the deoxidation products formed may, to a varying degree, remain in the steel as inclusions.

Results of investigations conducted by Gerhard Derge, metals research laboratory, Carnegie Institute of Technology, Pittsburgh, show that the use of rotating induction furnace with a heavy walled fused silica crucible and an iron liner at the slag line has made it possible to study the reactions between molten iron and slags of the iron oxide-silica system which are not saturated with silica. The study shows that the iron with these slags contains much more oxygen than with slags which are saturated with silica.

Mr. Derge also concludes that the oxygen content of the iron is determined by the percentage of iron oxide in the slag and the temperature. The oxygen distribution can be calculated from that observed for pure iron oxide if a slag molecule is used based on the $Si_2O_6^{-4}$ unit, and by considering that those oxygens which are linked to the silicate through iron are highly ionized and similar in chemical properties to the oxygen in pure iron oxide slag.

Materials handling in Open Hearth Operations—Materials handling and transportation in open hearth operations is not a new problem, but is one that grows daily. For the past several years, the emphasis has been on increased tonnage through furnace enlargement and practice improvement. As a consequence, many plants are confronted with the problem of having furnaces that are capable of producing faster than raw materials can be delivered and charged. According to W. W. Bergmann, assistant superintendent, open hearth department, Armco Steel Corp., Middletown, O., statistical studies made after furnace enlargement show that production rate is in direct proportion to speed with which limestone, ore, scrap and pig iron are delivered and charged.

Reporting on Armco's materials handling setup, Bergmann outlined the necessary steps in the development of the open hearth department. Of necessity, he stated, other open hearth organizations may have to approach their problems from different directions, due to definite fundamental strength or weakness evident in the original design, practice or method of operation. There is no magic word that will cause materials to flow freely through the maze of movements required in the enlarged high production open hearth shop. Neither will engineering nor development ever eliminate the necessity for having an alert, conscientious well-trained organization using the utmost enthusiasm and team spirit to get maximum results.

Paints for Enclosed Structural Members—An investigation of paint systems for the protection of steel was reported by H. A. Pray, supervisor and R. S. Peoples, assistant supervisor, Battelle Memorial In-

CASTINGS ON TOUR: Importance of foundry products to industry and to ultimate consumer is currently being demonstrated by this mobile exhibit of malleable iron castings, foundry materials and equipment—part of Lake City Malleable Co.'s permanent progressive educational program. Housed in a converted bus, the display will visit educational institutions and manufacturing plants during a 100,000-mile countrywide tour which started in Cleveland this month

stitute, Columbus. In recent years, isolated instances of corrosion difficulties resulting from condensation of moisture between the interior and exterior walls of dwelling houses constructed from steel have attracted considerable attention and interest. When condensation occurs to a sufficient degree, damage to the strength properties of the structure may result. No definite statistics are available to indicate how widespread the problem is, but there is no doubt that the structural members must be coated for corrosion protection, and that coating systems vary in their effectiveness for this purpose.

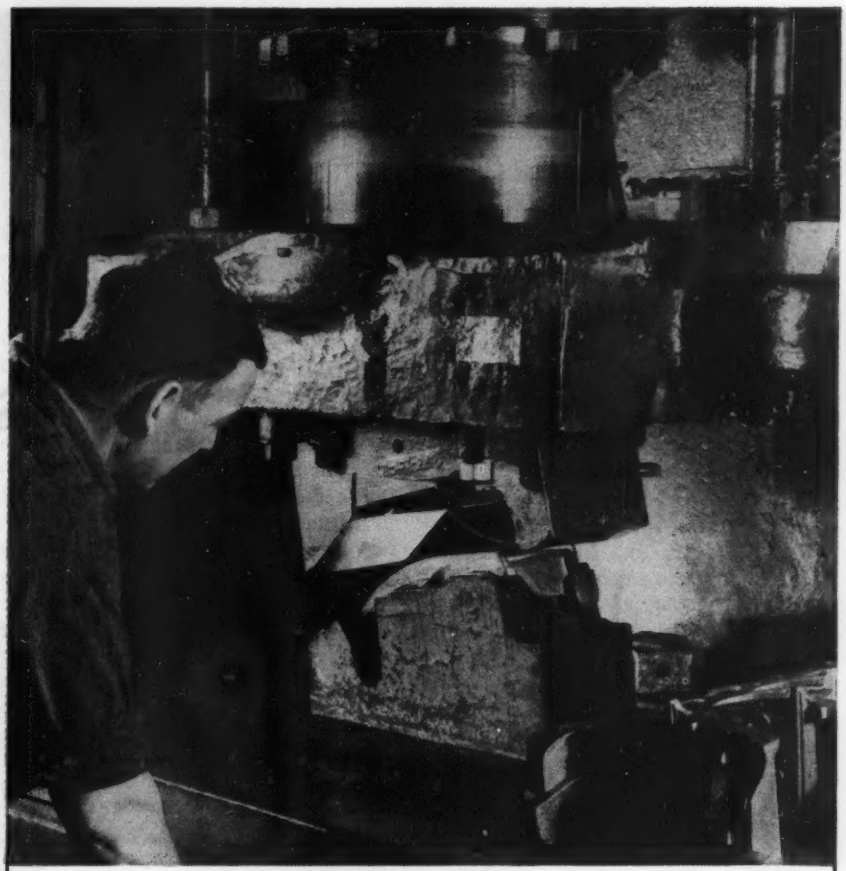
Some 34 kinds of paint systems were studied. Most of them are fairly well known and established systems, although a few are of more recent development. Most were of the single-coat, air-dry type.

Results of tests indicated that continuous immersion in water is the most severely corrosive condition studied. Many of the coating systems deteriorated rather rapidly when subjected to this exposure which resulted in attack on the base steel. The systems which seemed to afford maximum protection (little evidence of base metal attack) when the steel is completely coated were those in which the pigment was either essentially 100 per cent red lead or predominantly so, or contained zinc chromate. The asphaltum-type paints and those whose pigment contained zinc dust, zinc oxide or zinc chromate in some combination were next in order of merit.

Eleven Joints Brazed Simultaneously

Eleven joints are silver alloy brazed on 540 brass subassemblies per hour by an application of closely controlled radiant gas heat in a special purpose automatic machine developed by Selas Corp. of America, Philadelphia. Using the Gradiation method, seven gas-tight joints which are brazed simultaneously along with four support joints.

Machine has 46 ceramic gas-air burners, each of which is adjustable with additional heat control provided at the four burner manifolds. The two machine turntables are controlled by a variable-speed drive, synchronized exactly to the requirements of heating time and gas volume. Premixed gas and air are supplied to the machine in proper proportions for complete combustion and at a constant pressure. The combustion system has automatic fire checks.



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During recent years and to great extent, mass production has been made applicable to the manufacture of individual parts. At the same time, careless workmanship has made "mass-production" notorious for inaccuracy and poor quality. Buyers of mass-produced material have become skeptical of "promised" accuracy!

It's common knowledge that sand mold castings, for example, cannot be held to the thousandth of an inch... but *accepted* specifications should be met! Slight warpage, minor shifts and the like are more than a nuisance when it comes to holding down finished cost!

In Unitcast foundries there is no "promised" accuracy. Unitcast is consciencious about *accepted* specifications, and as a result, quality control is not a "one-man" responsibility. From the pattern shop to the final inspection, casting quality is closely guarded by a unique system that delivers accurate steel Unitcastings to *fit specifications!*

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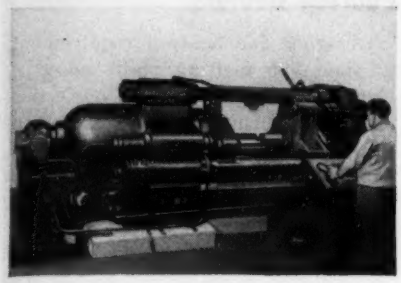
New Products and Equipment

Extrusion Press

Rods and shapes from light metals and other nonferrous alloys may be produced rapidly with the oil hydraulic extrusion press announced by Hydropress Inc., 570 Lexington Ave., New York 22, N. Y. The self-contained machine is built in 500 and



1000-ton capacities and requires little floor space.

Production of 50 to 60 billets per hour may be obtained. Press is designed for accessibility and quick change of dies. This makes it possible to limit production to extruding the shapes actually needed. Such shapes as window sections, ladder sides, trim moldings and structural shapes may be extruded.

Check No. 1 on Reply Card for more Details

Milling Machine

Top, bottom and both sides of cylinder heads may be milled with the automatic transfer-type Rigidmil. built by Sundstrand Machine Tool Co., Rockford, Ill. Machine (below) has three milling stations, one turnover station, an idle station and loading and unloading stations. All stations can be controlled from the master control button panel or individually from the station button control panels. Cylinder heads are shuttled from station to station by the return movement of the milling heads.

Operator needs only to locate the cylinder heads on the loading station and press the cycle start button. All subsequent movements are automatic. Each milling head has an automatic cycle of rapid approach, feed and rapid return. All of the traveling heads are intertimed so that none will start the rapid return or shuttling movement until all are ready. A motor driven chip conveyor removes chips from the machine.

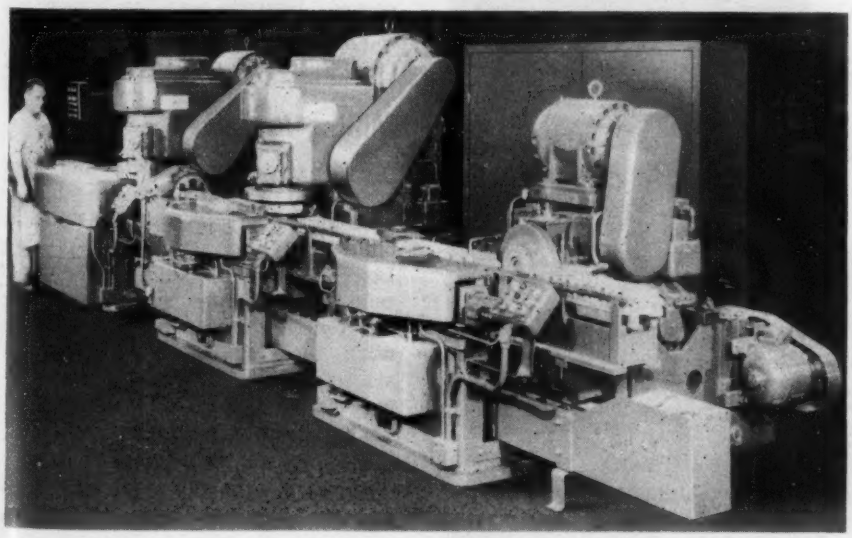
Check No. 2 on Reply Card for more Details

Cylinder Block Gage

Designed to check each of the bores in the V-8 motor block at four different points is the Precisionaire cylinder block gaging machine developed by Sheffield Corp., Dayton 1, Ohio. Cylinder block comes to the gaging machine on a roller conveyor and moves into position on a turntable. It is locked in the proper position by hydraulically actuated pins. Operator then lowers four gaging spindles into the cylinder bores by pressing a button to start the inspection operation.

Each gaging spindle has four sets of air jets to make four separate checks in each bore. Positions of the floats in the 16 glass tubes indicate if each bore is within specified tolerance limits for taper and diameter. Turning of a handle rotates the spindle 180 degrees and obtains a full 360-degree check for out-of-round. Float position indicates classification in steps of 0.00025-inch. Classification is stamped with a manually operated device. Gaging spindles are retracted, the turntable rotated 180 degrees and the same procedure followed to inspect the opposite bank of four cylinder bores.

Check No. 3 on Reply Card for more Details



Impact Wrench

Large studs, bolts, nuts and cap screws from 1¼ to 2 inch thread size may be handled with the size 577 impact wrench announced by Ingersoll-Rand Co., Phillipsburg, N. J. Wrench operates on the rotary impact principle by which motor torque is converted into 1000 powerful rotary impact blows per minute. This principle makes the machine suitable

for running or removing large nuts and aids in the removing of rusted or frozen nuts and in tight drawing of nuts and cap screws.

Weighing only 72 pounds less socket, the wrench makes extensive use of magnesium in its housing. Overall length to shoulder of square driver is 24½ inches. Side to center distance of hammer case is 2 13/16 inches. Free speed is 535 to 565 rpm.

Check No. 4 on Reply Card for more Details

Busway

Both trolley power takeoff and a continuous outlet for fluorescent lights and small power tools are provided by the LTG Flex-A-Power plug-in or trolley busway announced by Trumbull Electric Mfg. Co., Plainville Conn. It is available in two, three or four-pole construction with one compact housing and is rated at 50 amp, 250v ac or dc. Two or more circuits can be run in one hous-

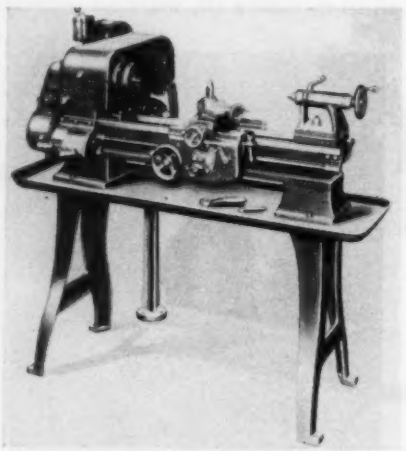
ing and still be controlled separately.

Plugs or trolleys are polarized so that loads may be balanced conveniently on both sides of the busway. Standard fittings such as elbows and radius sections are available so that custom-engineered installations can be achieved. The busway may be taken apart for reuse or relocation without scrapping any of the parts.

Check No. 5 on Reply Card for more Details

Swing Lathes

With a heavier headstock, the 11-inch swing lathe announced by Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill., combines preloaded ball bearing spindle mounting to assure sustained accuracy at spindle speeds from 45 to 1500 rpm without bearing adjustment. Lathe has a 1-inch collet capacity for drawin collets and center distances of 24 and 36 inches. Total spindle runout is held to within 0.0005-inch 12 inches from the bearing.



Two V-ways and two flat ways of the heavier bed are precision ground to a tolerance of 0.0005-inch along the lineal capacity of the lathe. Self-lubricating bronze bearings protect against wear at points where bearings are not ordinarily used. Quick change gear equipment provides selection of 48 threads and feeds. Lathes are available in cabinet and bench types as well as the conventional floor types.

Check No. 6 on Reply Card for more Details

Motorized Hand Truck

Ball bearing motor, larger armature and field coils, high starting torque and lower draw on battery are features of the motorized hand truck equipped with a more powerful motor, announced by Moto-Truc Co., Cleveland, O. In operating the motor unit, the natural grip roller handle is grasped and pulled forward, thus releasing the steering handle from the safety switch. Handle is then turned in the direction of travel for the first speed and a slight additional turn operates the second speed. Releasing the grip on the handle returns it to vertical position, cutting off the main switch and applying the dead man control brakes to the drive wheel.

Push buttons in the ends of the handle within finger tip reach control lifting and lowering. It is possible to replace truck motors in 15 to 30 minutes, minimizing delays in servicing. Change is made by removing four bolts and two cables.

Check No. 7 on Reply Card for more Details

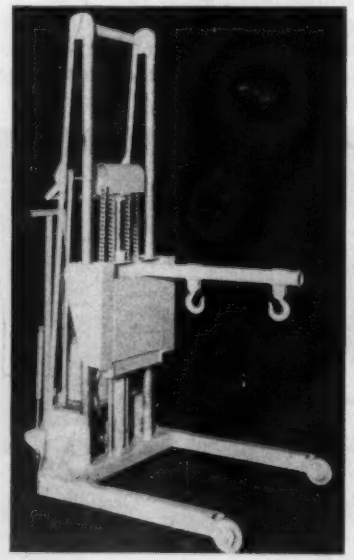
Conveyor

Produced by Union Steel Products Co., Albion, Mich., is the Wendway conveyor which is constructed to turn corners, run up, over and down. Items are carried, not pushed along, there being no tumbling or jamming. Fragile parts ride smoothly. Conveyor is built of 12 gage, hot-rolled steel with a galvanized finish. Units are installed in one, two, three or any number of tiers which operate in unison or separately.

Check No. 8 on Reply Card for more Details

Special Lift Truck

Featuring a hydraulic elevating boom which raises from 16 inches in the lowered position to 70 inches when fully elevated, a special lift truck, built by Lyon-Raymond Corp., 2206 Madison St., Greene, N. Y. uses a special sling arrangement to lift the assembly to be moved. Load is lifted by a hand pump actuating a hydraulic hoist. After the load is raised, the shipping crate is placed in position between the base forks of the truck and the load is gently lowered into the crate by finger tip control lever.



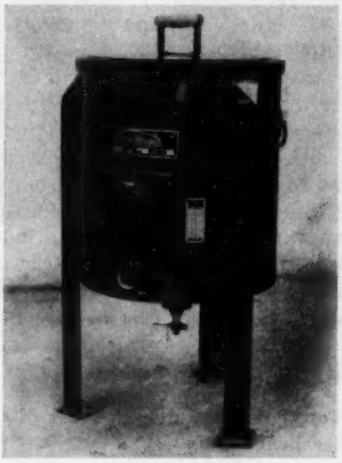
Use of this special truck eliminates damage to finished assemblies and increases speed of packing. Truck is the standard high lift model with an elevating boom substituted for the platform and the base widened to accommodate the shipping container. A special flow control valve increases lowering accuracy.

Check No. 9 on Reply Card for more Details

Pouring Heaters

Designed for heating requirements of such low melting point alloys as bismuth base alloys and Wood's metals, the pouring heaters offered by Sta-Warm Electric Co., Ravenna, O., have a heavy pressed steel inner pot in a sheet metal housing which will not contaminate the alloys.

Models are being offered in 3 and 20 gallon capacities. Low heat concentration and even heat distribution per square inch, plus selective temperature control in the range of 100-300° F, prevents overheating. A pouring valve is heated locally to prevent freezing of the alloys as they are poured. Heaters may be either leg or sling mounted.



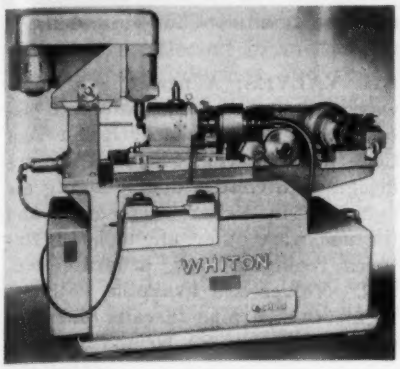
Check No. 10 on Reply Card for more Details

Milling Machine

Built for cutting bevel and spur gears and pinions, the special purpose high production milling machine built by Whiton Machine Co., New London Conn., is capable of additional milling operations, such as milling slots on the face or outside diameter, work requiring hex, square or more sides to be milled. Antifriction bearing mounted vertical spindle is individually motor driven through V-belts, allowing use of carbide cutters.

Machine table is actuated by a combination of air and cam to im-

part the proper rapid advance to and from the cutting position. The cam can be arranged so that in feeding onto the work a constant area of cut can be maintained to remove a con-

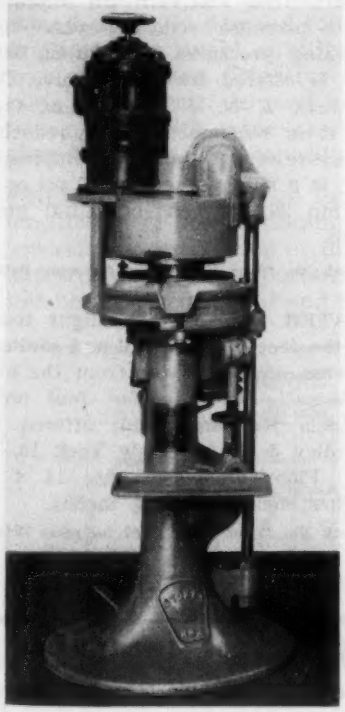


stant cubic inch of stock. Attached to the table is a work spindle in a housing capable of swiveling to mill any angle up to 90 degrees. Work is held in the spindle by a collet. Work up to a capacity of 8 inches in diameter may be handled. Cutter speed with high speed cutters is 125 surface feet per minute.

Check No. 11 on Reply Card for more Details

Compressing Machine

Abrasive materials such as powdered metals, powdered glass and ceramics may be compressed in a high speed rotary machine announced by F. J. Stokes Machine Co., 5900 Tabor



Rd., Philadelphia 20, Pa. Compressed parts up to ½-inch in diameter can be produced at rates up to 300 parts per minute on the B-2X Press.

For Every Job of Swaging THERE IS AN ETNA ROTARY SWAGING MACHINE

6000 HAMMER BLOWS OF INFINITE FORCE PER MINUTE

- The dies and hammers rotate around the work, which is held stationary, quickly swaging it to desired size and shape.
- Built to handle the severest work with capacities up to 14 inches in diameter.
- Integral forced coolant and lubrication systems.
- handle hot or cold work.
- Readily equipped with a variety of feeding devices.
- Cast alloy steel drum mounted on base and bolted to front housing.
- Timken bearings take spindle thrust. Radial ball bearing in rear of flywheel.
- Alloy steel forged, heat-treated and ground spindle.
- A taper fit is used for the fly wheel which is further secured by a split nut and key.
- Hammers, rolls and inner ring of heat-treated alloys.
- Motor is mounted over the machine on an adjustable bracket, the power being transmitted by V-belts.

WRITE FOR DESCRIPTIVE LITERATURE.

THE ETNA MACHINE CO.

3407 MAPLEWOOD AVE. • TOLEDO 10, OHIO

SPECIALIZATION . . .

Johnson Steel & Wire Company is a specialty plant. Here are extra refinements not found in a tonnage mill. Working with the Johnson Scientific Laboratory Control, Johnson Quality Control follows through in the mill, keeping a watchful eye always on all the factors involved in producing wire for every application. Warehouse stocks Worcester • Chicago • Los Angeles.

JOHNSON
STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.

NEW YORK PHILADELPHIA CLEVELAND DETROIT AKRON CHICAGO
ATLANTA HOUSTON TULSA LOS ANGELES TORONTO

In addition to compressing a wide assortment of shapes and sizes, the press can be arranged to produce parts having cored holes, etc. With a 1 hp gearhead motor mounted vertically above the die area of the press, possibility of abrasive material working into and damaging the motor is eliminated. Press supplies up to 2½ tons pressure from above and below simultaneously.

Check No. 12 on Reply Card for more Details

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SILICONE RUBBER PARTS: Gaskets, diaphragms, grommets, washers, seals, packings, tubing and other extruded and molded products made from the new X-7 silicone rubber are available from Stalwart Rubber Co., Bedford, O. Rubber is suitable for dielectric applications and is practically unaffected by temperatures ranging from minus 160 to more than 500° F. It is recommended for use in handling hot or cold fluids, gases and others.

Check No. 13 on Reply Card for more Details

CAR UNLOADER: Markroy Co., Madison, Ill., introduces a new car unloader that is a bucket-type elevator of tubular steel construction. It transfers materials such as gravel, stone, coal, sand, cement, cinders and chemicals from hopper cars to trucks or stockpile at rate of 1½ to 2 tons per minute.

Check No. 14 on Reply Card for more Details

PLATE BENDING ROLLS: Webb Corp., Webb City, Mo., offers a line of corrugated plate bending rolls. They can be furnished in numerous sizes and capacities and are designed to form corrugated plate into culvert pipe.

Check No. 15 on Reply Card for more Details

SMOKE DETECTOR: A single unit photoelectric smoke detector for early detection of incipient fires in hazardous plant and warehouse areas is available from Walter Kidde & Co. Inc., New York, N. Y. Control panel is nerve center of the detector; it transmits fire alarms and gives warning of mechanical and electrical disturbances within the apparatus.

Check No. 16 on Reply Card for more Details

BROACH: Kase Machine Co., Cleveland 19, O., announces a small pencil-size Glenny broach that is capable of cutting 1/16-inch wide keyways up to 0.070-inch in depth. It is available in sizes ranging from 5/16 to 1½ inches in diameter and from 6⅞ to 11¼ inches in length. Blades widths range from 1/16 to ½-inch.

Check No. 17 on Reply Card for more Details

SAW SHARPENING FIXTURE: A new saw sharpening fixture for all types of circular saws from 1½ to 16 inches in diameter is announced by Treyco Products, Buffalo 17, N. Y.

Check No. 18 on Reply Card for more Details

INDICATOR: A new high temperature indicator for general, noncritical use is announced by Claude S. Gordon Co., Chicago 16, Ill. Known as model XA-100 Xactemp indicator, it is calibrated for either iron-constantan or chromel-alumel thermocouples; a choice of several scale ranges is available.

Check No. 19 on Reply Card for more Details

ELECTROPLATING ANODE: A new copper flat-top electroplating anode has been announced by Wagner Brothers Inc., Detroit 3, Mich. It features a smooth surface and eliminates gates and flash which cause hanging on the baskets. It is ready for use without fabricating or attaching hooks to oval anodes.

Check No. 20 on Reply Card for more Details

ANTIRUST PAINT: A new heavy duty aluminum antirust paint known as Rustrem Super Aluminum is announced by Speco Inc., Cleveland 9, O. It utilizes a recently developed aluminum paste. It can be applied over rust without wire brushing or scraping and pentrates and seals the surface.

Check No. 21 on Reply Card for more Details

CONTROL VALVE: Model 6552 foot-operated, four-way control valve is offered by Logansport Machine Co. Inc., Logansport, Ind. It is built in three sizes: ⅜, ¾ and 1 inch port sizes. It is designed for pressures up to 150 psi.

Check No. 22 on Reply Card for more Details

TAKE-UP UNIT: Wide slot SC ball bearing take-up unit, announced by Dodge Mfg. Corp., Mishawaka, Ind., consists of a deep groove precision bearing with large balls and retainer to minimize wear enclosed in an outer housing with wide milled slots or ways on each end for supporting guides. It is suitable for conveyor and power transmission service.

Check No. 23 on Reply Card for more Details

ANODE BAGS: Enthone Inc., New Haven, Conn., announces development of new nylon anode bags to cover nickel, copper, silver, zinc and other metal anodes used in electroplating solutions. Strength of bags is maintained in both acid and alkaline solutions at temperatures up to 150° F.

Check No. 24 on Reply Card for more Details

AIR VALVES: A new line of four-way air valves of the balanced piston type is announced by Keller Tool Co., Grand Haven, Mich. They are designed to control double-acting air cylinders in Keller Airfeedrills and for use with other air tools or fixtures requiring fast, accurate control. Valves are available with ¼, ½ and 1-inch pipe threads and with air capacities of 30, 90 and 350 cfm.

Check No. 25 on Reply Card for more Details

RELAY: Vapor Heating Corp., Chicago, Ill., offers a solenoid actuated relay with bridging contact arms that are self-cleaning by a wiping action each time contact is made or broken, with two poles normally open or closed.

Check No. 26 on Reply Card for more Details

SWITCH: Micro Switch, Freeport, Ill., offers BAF1-2RN switch designed for severe service in industrial use. It has a steady state current rating of 20 amp and inrush capacity of 75 amp at voltages up to 460 v ac.

Check No. 27 on Reply Card for more Details

REDUCING VALVE: An improved high pressure reducing valve for working pressures as high as 6000 psi is offered by Atlas Valve Co., Newark 2, N. J. Known as type E, it is recommended for reducing pressure of water, oil and compressed air, in a single stage to 250 psi or to within 20 per cent of initial pressure.

Check No. 28 on Reply Card for more Details

WATER COOLER: A slight touch of the foot brings a full and sanitary stream of cool water from the new automatic water cooler, foot pedal models F-6 and F-10, offered by Cordley & Hayes, New York 16, N. Y. Floor dimensions are 14 x 15 inches; height is 40⅜ inches.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

CONTINUED "unwinding" of business activity is reflected in further downward adjustments in production and prices of steel at mill levels. However, the readjustments can be considered orderly, for none as yet have been particularly precipitous.

Consumers of iron and steel are in many cases continuing to work off inventories. This assimilation is watched closely for indications as to the end of it and a resultant leveling off of demand. Already there are signs the assimilation has been completed in some spots, but as yet they are insufficient in number to be conclusive.

PRODUCTION—The downward adjustment in activity lowered the nation's steel ingot production a half a point further last week to 94.5 per cent of capacity as some producers took off open hearths for lack of business. This dropped the rate below that of the corresponding 1948 week for the first time in 1949.

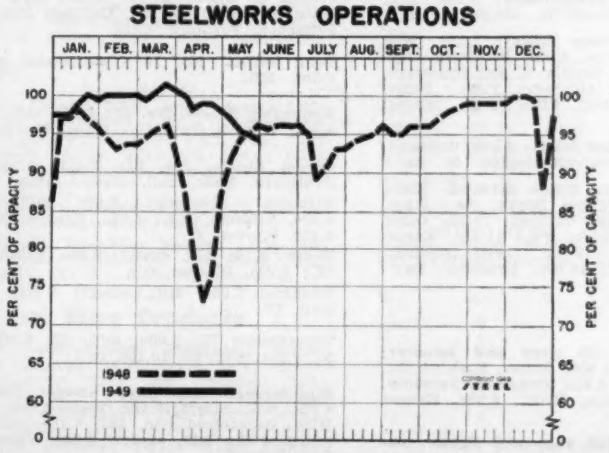
DEMAND—The downtrend in ingot production will likely continue in view of the lower rate of steel consumption and the inclination to work inventories down to the lowest possible point. To hasten disposal of inventories, some consumers are still dumping surpluses on the market. However, some fabricating plants have found they had been too pessimistic and cut production below a level necessary to fill incoming orders. Consequently, their upward revision in production schedules suggests they will be back in the market for more steel. The overall easing in demand for steel is permitting consumers to avoid substitution and use the type of steel best fitted for a specific application. As a result, demand for alloy steels continues dull, with some producers turning out alloy at only half of capacity.

PRICES—As competition for steel business intensifies there are continuing instances of price concessions, some being at the mill level, others at warehouses. One important producer of stainless has restored its old and more liberal policy of quantity discounts; one producer lowered its base price of cold-rolled strip; and another made cuts on numerous products. A warehouse lopped off prices an average of $5 a ton. Further reduction in the price of zinc, has permitted another cut, an average of $1.50 a ton, in coating extras on galvanized sheets. One effect of price concessions is the increased willingness of fabricators and construction companies to quote firm prices on products and jobs. Reflecting the easing in some prices, STEEL's price composite on finished steel eased last week to $92.77 from the previous week's $93.55. Price composite on semifinished steel was unchanged at $66.72. In the nonferrous field, prices continued to decline, with lead dropping 2c, zinc 1c and copper three-eighths of 1c.

PIG IRON—Foundries, one of the first businesses to feel the current easing in business, continue at a low level of operations. Reflecting this is the shutting down last week of a merchant iron blast furnace at Cleveland. However, in some instances foundries have worked off inventories and are placing orders again, and the prospect that others may do likewise soon is the source for some optimism. Price composite on steelmaking pig iron was unchanged last week at $45.60.

SCRAP—A generally dull market in scrap was highlighted last week by a firming up in price by $1 in one mid-West market by purchase of major steelmaking grades by two large mills. This pushed STEEL's price composite on steelmaking scrap to $22 from the preceding week's $21.67. Indicating possibly that the orders were for larger tonnages than could be obtained easily, the instance brings into focus the scrap traders' warning that present prices provide insufficient incentive to stimulate scrap flow from remote areas. However, steelmakers, as a whole, feel they have little to fear immediately, in view of generally heavy mill inventories of scrap and the decreasing pace of steel production.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended May 28	Change	Same Week 1948	Same Week 1947
Pittsburgh	93.5	— 0.5	96	103
Chicago	98.5	— 0.5*	94	95.5
Eastern Pa.	91.5	— 0.5	90	89
Youngstown	105	None	103	93
Wheeling	86	None	97	81.5
Cleveland	104.5	+ 3.5	97	93.5
Buffalo	101.5	+ 4	93	88.5
Birmingham	100	None	100	99
New England	56	—10	78	95
Cincinnati	94	— 2	102	87
St. Louis	78	+ 2.5	85	68.5
Detroit	70	None	100	90
Western	85	— 7	..	..
Estimated national rate	94.5	— 0.5	96	95.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. * Revised.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*	May 28	May 21	Month Ago Apr. 1949	Year Ago May 1948	5 Years Ago May 1944
Finished Steel	$92.77	$93.55	$94.48	$80.27	$56.73
Semifinished Steel	66.72	66.72	68.45	68.62	36.00
Steelmaking Pig Iron	45.60	45.60	46.16	39.66	23.00
Steelmaking Scrap	22.00	21.67	24.06	40.67	19.17

FINISHED STEEL WEIGHTED COMPOSITE†	
Apr. 1949	4.02714c
Mar. 1949	4.05098c
Feb. 1949	4.06149c
Apr. 1948	3.62766c
Apr. 1944	2.43493c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. April, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	May 28, 1949	Apr. 1949	Feb. 1949	May 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.45c	2.875c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.365
Steel bars, Chicago mills	3.35	3.35	3.35	2.875
Shapes, Pittsburgh mills	3.25	3.25	3.275	2.775
Shapes, Chicago mills	3.25	3.25	3.25	2.775
Shapes, del. Philadelphia	3.4918	3.4918	3.48	2.98
Plates, Pittsburgh mills	3.40	3.50	3.50	2.925
Plates, Chicago mills	3.40	3.40	3.40	2.925
Plates, del. Philadelphia	3.6348	3.6348	3.7256	3.21
Sheets, hot-rolled, Pittsburgh mills	3.25	3.26	3.275	2.775
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.50
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.775
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.50
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.90
Strip, hot-rolled, Pittsburgh mills	3.275	3.50	3.275	3.05
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.775
Bright basic, wire, Pittsburgh	4.15	4.15	4.325	3.725
Wire nails, Pittsburgh mills	5.15	5.15	5.775	5.125
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.80

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$60.00
Slabs, Chicago	52.00	52.00	52.00	45.00
Rerolling billets, Pittsburgh	52.00	52.00	59.00	45.00
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.175c

* Nominal. † 1.50 lb coating.

Pig Iron

	May 28, 1949	Apr. 1949	Feb. 1949	May 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$41.038
Basic, Valley	46.00	46.00	46.00	39.00
Basic, eastern, del. Philadelphia	49.39	49.6175	50.3002	42.17
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	40.538
No. 2 fdry., del. Philadelphia	49.89	50.1175	50.8002	42.67
No. 2 foundry, Chicago	46.25	46.25	46.25	39.00
No. 2 foundry, Valley	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham	39.38	43.38	43.38	38.63
Southern No. 2 del. Cincinnati	45.43	49.43	49.43	43.90
Malleable, Valley	46.50	46.50	46.50	39.50
Malleable, Chicago	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	56.50
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	163.00	151.00*

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$23.00	$25.12	$40.00	$40.25
Heavy melt. steel, No. 2, E. Pa.	19.25	20.69	35.69	39.00
Heavy melt. steel, No. 1, Chicago	21.50	23.75	35.75	39.25
Heavy melt. steel, No. 1 Valley	22.00	22.75	37.75	40.25
Heavy melt. steel, No. 1 Cleveland	18.50	20.38	37.25	39.75
Heavy melt. steel, No. 1, Buffalo	22.25	24.38	40.50	43.00
Rails for rerolling, Chicago	27.75	31.31	48.19	51.75
No. 1 cast, Chicago	27.50	30.25	44.25	69.00

Coke

Connellsville, beehive furnace	$14.25	$14.44	$14.50	$12.94
Connellsville, beehive foundry	16.75	17.00	17.00	15.06
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $80-$85 per gross ton. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $65-$75 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles; 4.15c Monessen, Pa. Basic open-hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c, Atlanta; 3.55c, Ecorse, Mich.; 4.00c Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Struthers, O., Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. **Double Refined:** 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. **Staybolt:** 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.75c, Conshohocken, Pa.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.05c, Torrance Calif.; 5.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.80c, Kokomo, Ind.; 5.15c, Pittsburgh, Torrance, Calif.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.30c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. **Armature:** 5.45c, mill, except: 5.95c, Warren.

Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; **65,** 8.60c, mill, **58,** 9.30c, mill, **52,** 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except; 5.15c, Youngstown, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.40c, Atlanta; 4.00c, Pittsburg, Torrance, Calif.; 4.20c, Kansas City, Mo.; 4.25c, Seattle, San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.65c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip (0.25 carbon and less); 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.00-4.50c, New Castle, Pa., Youngstown; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.25-4.45c, Detroit; 4.50c New Haven, Conn., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N.J.; 4.85c, Wallingford, Conn.; 5.55c, Fontana, Calif.; 5.75c, Los Angeles. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.25-4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Struthers, O., Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown, Ecorse, Mich., mill.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.50c, Coatesville, Pa.; 3.55c, Conshohocken, Pa.; 3.65c, Claymont, Del., Ecorse, Mich.; 3.95c, Harrisburg, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.50c, Houston; 4.35c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.45c, Ecorse, Mich.; 5.65c, Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.75c, Phoenixville, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 3.80c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Struthers, O.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa., Portsmouth, O.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 123, Pittsburg, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Portsmouth, O., Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 114, Duluth; 116, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind., Portsmouth, O.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50-28.75	30.50-32.00	37.50-40.75
302	28.50-28.75	33.00-33.75	37.50-40.75
303	31.00-31.50	36.50-39.75	39.50-43.00
304	30.00-31.25	35.00-35.75	39.50-43.00
316	46.00-48.00	55.00-57.25	53.00-57.25
321	34.00-34.75	44.50-45.75	45.50-49.00
347	38.50-39.75	48.50-50.25	50.00-54.00

STRAIGHT CHROMIUM STEELS

410	22.75-23.00	26.50-27.00	32.00-33.00
416	23.25-23.50	28.25-33.50	32.50-33.50
430	23.25-23.50	27.00-27.50	34.75-35.50
446	32.50-33.00	60.00-62.25	46.50-50.00

STAINLESS-CLAD STEELS

	Plates —Cladding— 10%	Plates —Cladding— 20%	Sheets —Cladding— 10%	Sheets —Cladding— 20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

For prices of bolts, nuts and rivets please refer to May 23 issue, Page 147.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton. Discounts from base follow:

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	39½– 41½	11– 13	1	46½– 48½	30½– 32½
¼	37½– 39½	13– 15	1¼	47– 49	31– 33
⅜	34– 36	9½– 11½	1½	47½– 49½	31½– 33½
½	41– 43	23½– 25½	2	48– 50	32– 34
¾	44– 46	27½– 29½	2½, 3	48½– 50½	32½– 34½
			3½ & 4	44½	28

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	40½	24	38½	22	28– 38½	11½– 22
2½	44½	28	41½	25	33½– 41½	17– 25
3	44½	28	41½	25	36– 41½	19½– 25
3½&4	42½– 46½	25– 30	43½	27	38½– 43½	22– 27
5 & 6	42½– 44½	25– 28	43½	27	43½	27
7	....	....	....	....	43½	26

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	40½	12	1¼	46– 48	31– 32
¼	38½	14			
⅜	35	10½	1½	46½– 48½	31½– 32½
½	40– 42	23½– 24½	2	47– 49	32– 33
¾	43– 45	27½– 28½	2½ & 3	47½– 49½	32½– 33½
1	45½– 47½	30½– 31½	3½ & 4	43½	27

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	39½	23	37½	21	27– 37½	10½– 21
2½	43½	27	40½	24	32½– 40½	16– 24
3	43½	27	40½	24	35– 40½	18½– 24
3½-4	41½– 45½	27½– 29	42½	26	37½– 42½	21– 26
5 & 6	41½– 43½	27– 27½	42½	26	42½	26
8	45½	28	44½	27	44½	27
10	45	27½	44	26½	44	26½
12	44	26½	43	25½	43	25½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Lap Weld Blk.	Lap Weld Gal.
⅜	+59	+90½	1¼	+22	+47½
½	+20	+47½	1½	+15½	+40
¾	+10	+36½	2	+ 7½	+31
1 and 1¼	+ 4	+27½	2½-3	+ 5	+26½
1½	— 2	+24	4½-8	+ 2	+22
2	— 2½	+23½	9-12	+12	+31½
			4	List	+20½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	.....	13.39-14.64	13.00	13.00
1¼	13	.....	15.87-17.34	13.21	15.39
1½	13	16.45	17.71-19.35	14.60	17.18
1¾	13	18.71	20.15-22.02	16.60	19.54
2	13	20.96	22.56-24.66	18.60	21.89
2¼	13	23.36	25.16-27.50	20.73	24.40
2½	12	23.54-25.73	27.70-30.28	22.83	26.88
2½	12	25.79-28.19	30.33-33.15	25.02	29.41
2¾	12	27.33-29.87	32.14-35.13	26.51	31.18
3	12	28.68-31.35	33.76-36.90	27.82	32.74
3¼	11	33.39-36.50	39.29-42.95	32.39	38.11
3½	11	35.85-39.19	42.20-46.13	34.78	40.94
4	10	44.51-48.65	52.35-57.22	43.17	50.78
4½	9	58.99-64.47	69.42-75.88	....	....
5	9	68.28-74.64	80.35-87.82	....	....
6	7	104.82-114.57	123.33-134.81	....	....

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.30, Minnequa, Colo.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§Chicago, district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	52.50	53.00	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	49.40	49.90	50.40	....
Ironton, Utah, furnace	47.00	47.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
‡Neville Island, Pa., furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)..$59.50

6.51-7.00..	60.50	9.01- 9.50.	65.50
7.01-7.50..	61.50	9.51-10.00.	66.50
7.51-8.00..	62.50	10.01-10.50.	67.50
8.01-8.50..	63.50	10.51-11.00.	68.50
8.51-9.00..	64.50	11.01-11.50.	69.50

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorous. F.o.b. furnace, Lyles, Tenn....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central furnace, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Diam.	Length	Cents per lb. f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace..	$13.50-15.00
Connellsville, foundry..	16.00-17.50
New River, foundry ...	16.50
Wise county, foundry..	15.35
Wise county, furnace..	14.60
Oven Foundry Coke	
Kearney, N. J., ovens.	$22.00
Everett, Mass., ovens.	
New England, del.‡.	22.70
Chicago, ovens	20.40
Chicago, del.	†21.85
Detroit, del.	24.16
Terre Haute, ovens....	20.20
Milwaukee, ovens	21.15
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens..	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens.	20.40
Portsmouth, O., ovens.	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective as of Oct. 1)	
Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50
(Effective as of Oct. 25)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores ....

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)

Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H. R. Rds.	C. F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.00‡	6.51	7.20	5.82	...	5.77	6.56	8.68	5.53	5.90	7.36
New York(c'try)	5.80‡	6.31	7.00	5.62	...	5.57	6.36	8.48	5.33	5.70	7.16
Boston (city) ..	6.10‡	6.70**	7.21	5.80	...	5.67	6.42	8.72	5.57	5.95	7.40
Boston (c'try) .	5.95‡	6.55**	7.06	5.65	...	5.52	6.27	8.57	5.42	5.80	7.25
Phila. (city)...	5.72‡	6.64**	6.88	5.60	...	5.55	6.34	8.40	5.25	5.53	6.74
Phila. (c'try)..	5.57‡	6.59**	6.73	5.45	...	5.40	...	8.25	5.10	5.38	6.59
Balt. (city)....	5.46	6.36	6.96	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.81	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	6.05**	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85‡	5.90**	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse)..	4.85	5.75[4]*	6.95	5.00	6.00	4.90	5.65	9.60	4.90	5.05-5.10	6.55
Detroit (w'hse)	5.42	6.22[4]*	7.53	5.42	6.42-6.73	5.48	6.15	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.80-6.96	5.15-5.18	6.15	5.15-5.16	5.85	8.24-8.40	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.65-6.81	5.00-5.03	6.00	5.00-5.01	5.70	8.24-8.25	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.98	5.38	6.10	5.43	6.18	...	5.43	5.63	7.03
Chicago (city).	5.00-5.20‡	5.90[4]	7.10	5.00	6.67-6.83	5.05	5.85	8.25[5]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05‡	5.75[4]	6.95	4.85	6.52-6.68	4.90	5.70	8.10[5]	4.90	5.10	6.55
Milwaukee(city)	5.18-5.38‡	6.08[4]	7.28	5.18	6.82-7.01	5.23	6.03	8.43[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.20	...	6.60	5.20	...	5.15	6.83	...	5.15	5.40	7.73[9]
Birm'ham(c'try)	5.05	...	6.45	5.05	...	5.00	6.68	...	5.00	5.25	7.58[9]
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	8.20	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	8.05	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70‡	9.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.30[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as annealed; ** 17 gage.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.ob. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10 % C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5 for max 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, corload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50%Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5 per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices. **90-95% Ferrosilicon:** Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.) C.l., lump. bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr.) Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx, 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

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Copper, Lead, Zinc Prices Drop

Producers lower quotations to 11.00c for zinc, 11.85c for lead and 17.62½c for copper on absence of buying support and unfavorable stockpiling developments

New York—Lead prices dropped 2 cents a pound and zinc 1 cent a pound last week as a result of continued absence of buying support by consumers. Availability of metal at new levels failed to stimulate much interest on the part of buyers. Copper also weakened with refiners lowering their buying prices for copper scrap ½-cent a pound and with a sale being made to Italy on the basis of 17.62½c a pound, f.a.s. New York, and to the Philadelphia mint at 17.50c for cathode copper, equivalent to 17.62½c for electrolytic. Remelt aluminum ingot prices declined ½ to 1¼-cents a pound.

The domestic nonferrous markets, especially zinc, were unsettled by reports from Washington concerning the government's stockpiling program. The Munitions Board is making no purchases of any strategic materials at present for the permanent stockpile because both interim appropriations and funds for the fiscal year 1949 are bogged down in Congress. Purchases by the government had been expected to take up the bulk of any slack which develops in consumer demand for metals. Furthermore, it is estimated that the Munitions Board has acquired nearly 500,000 tons of zinc which is believed to be close to the minimum objective for that metal. According to trade reports, most of the future purchases by the Board will be concentrated on other metals, including copper.

Zinc—The drop in prime western zinc to the basis of 11.00c, East St. Louis, represented the seventh drop since early March and brought the market to the lowest level since Jan. 20, 1948, 6½ cents under the postwar high. The precipitous drop had a parallel 33 years ago, the price having declined from 17.50c on May 2, 1916, to 11.00c on June 30 of that year.

Following the decline in primary zinc prices, producers of zinc dust and die casting alloys posted correspondingly lower prices.

Lead—Although lead was readily available here last week on the basis of 11.85c, St. Louis, one of the leading sellers has not officially changed his quotation from 14.80c, St. Louis. There have been eight reductions in the lead price since early March when the postwar high of 21.50c still prevailed. The market is now at the lowest level since Dec. 14, 1946. Sellers were disappointed by the failure of consumers to re-enter the market more actively at the new low levels, established by 1-cent reductions on May 23 and May 26.

As a result of the price cuts in primary lead, manufacturers of lead sheets and pipe reduced prices proportionately.

Copper—Uncertainty over prices continued to retard volume of business here last week. The Philadelphia Mint placed a contract for 300 tons of cathode copper with American Metal Co. Ltd. at 17.50c a pound, equivalent to 17.62½c a pound on the usual forms of wire bars. Italy also took better than 1200 tons on the basis of 17.62½c, f.a.s. New York. Delivery on the copper for the Mint is for July, August and September.

Copper is now quotable at 17.62½c, delivered Connecticut Valley, for electrolytic at the usual ⅛-cent over cathodes. This is the lowest price recorded since November, 1946. The decline since late March of this year from the 23.50-cent level has been 5.87½ cents a pound, or 25 per cent.

Two leading refiners reduced their buying prices for copper scrap ½-cent a pound on May 24 to the basis of 13.00c for No. 1 copper wire, 12.00c for No. 2 copper, and 11.00c for light copper.

The undertone of the market was also weakened by the statistics which were circulated covering April operations. Actual consumption of copper in April dropped to 65,454 tons, a decline of 24,380 tons from the revised March total of 89,834 tons. Deliveries of refined copper to fabricators declined to 76,127 tons from 113,154 tons in March, but these were 10,673 tons in excess of consumption. Fabricators' refined copper stocks increased to 396,454 tons from 387,871 tons at the end of March. Unfilled purchases of copper dropped sharply to only 35,855 tons from 85,945 tons while unfilled orders held by fabricators declined further to 215,997 tons from 244,064 tons at the end of the preceding month. The deficiency in stocks has been reduced to only 69,752 tons as of Apr. 30 compared with 151,060 tons at the end of 1948.

Tin—Consumers of tin continued to speculate regarding the possibility of lower prices after June 30 when the contract of the British Ministry of Supply with Malayan producers expires. The present New York price of $1.03 is close to the all-time high of $1.10 reached in 1918 and probably will be revised downward in line with other nonferrous metals.

Aluminum — Output of primary aluminum in March was 54,852 short tons, according to the Bureau of Mines. March production was 10 per cent above the 49,749 tons produced in February, so that the increase was approximately proportionate to the longer month. Output for the first quarter totaled 157,957 tons, or about 8 per cent greater than the corresponding period in 1948. Stocks of primary aluminum at reduction plants on Mar. 31 were 22 per cent lower than at the end of February, amounting to 11,786 tons and 15,101 tons, respectively.

The supply of crude and semi-crude aluminum was supplemented in March by net imports of 5736 tons. March imports included 6773 tons of crude metal and alloys and 2216 tons of plates, sheets, bars, etc., while exports included 223 tons of ingots, slabs and crude and 3030 tons of plates, sheets, bars, etc.

Remelt Aluminum—Smelters lowered secondary aluminum ingot prices ½ to 1¼-cents a pound last week as the result of intensified competition for the small amount of business now being transacted. No. 12 aluminum ingot dropped to a range of 14.25c to 14.50c while deoxidizing grades ranged from 12.50c to 15.75c.

U. S. Buys British Platinum

Washington—United States government has purchased 10,000 troy ounces of platinum from the United Kingdom out of counterpart parts, according to the Economic Co-operation Administration. Although ECA did not reveal the price paid for the metal, it was officially stated that the price paid was not above the "world market price." The price of soft platinum in New York is $72 an ounce. Counterpart funds represent the amount paid to the government of the participating country by purchasers of materials in that country. The commodities are purchased by the participating country from grants made by ECA.

Nickel Output To Be Reduced

New York — International Nickel Co. plans to curtail production of nickel in Canada by about 10 per cent due to lessened demand. The company is expected to close down one reverberatory furnace at the Copper Cliff smelter on June 1. This would also result in a reduction in production of copper.

Sales of nickel in all forms by the company in 1948 were 240,098,274 pounds, compared with 205,278,868 pounds in 1947. Over 90 per cent of this total was consumed in the United States, Great Britain and Canada. The company's refined copper sales in 1948 were 219,130,830 pounds, compared with 220,671,157 pounds in 1947. About 52 per cent of the copper was sold in Canada and 48 per cent exported in 1948.

Schedules Vacation Shutdown

Waterbury, Conn—Chase Brass & Copper Co., this city, will close its mills and factory for a two-weeks' vacation from Friday night, July 1, until Monday, July 18. The shutdown includes: Waterbury mill, both of the Cleveland mills, the Waterbury Mfg. Co. fabricating plant, and the wire cloth mill.

While there will be no actual production during the shutdown, the offices of all plants will remain open. Sales offices and warehouses throughout the country will be open as usual to make prompt shipments from warehouse stocks. Orders scheduled for shipment from the mills during the shutdown period will be shipped prior to or following the vacation period on the advice of the customers.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley; Lake, Nom., Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 14.75-17.00c; 88-10-2 (No. 215) 25.50c; 80-10-10 (No. 305) 21.75c; No. 1 yellow (No. 405) 12.25-14.50c.

Zinc: Prime western 11.00c, brass special 11.25c, intermediate 11.50c, East St. Louis; high grade 12.00c, delivered.

Lead: Common 11.85c; chemical, Nom.; corroding, 11.95c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 15.50-15.75; No. 12 foundry alloy (No. 2 grade) 14.25-14.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 15.50-15.75; grade 2, 14.50-14.75; grade 3, 13.50-13.75; grade 4, 12.50-12.75. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $83-$86 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $72-$75 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 31.68; yellow brass 29.10; commercial bronze, 95%, 31.73; 90%, 31.38; red brass, 85%, 30.51; 80%, 30.17; best quality, 29.84; nickel silver, 18%, 42.42; phosphor-bronze, grade A, 5%, 50.82.

Rods: Copper, hot rolled 27.53; cold drawn 28.78; yellow brass, free cutting, 23.69; commercial bronze, 95% 31.42; 90% 31.07; red brass 85% 30.20; 80% 29.86.

Seamless Tubing: Copper 31.72; yellow brass 32.11; commercial bronze 90% 34.04; red brass 85% 33.42; 80% 33.08.

Wire: Yellow brass 29.39; commercial bronze, 95% 32.02; 90% 31.67; red brass, 85% 30.80; 80% 30.46; best quality brass 30.13.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.80, l.c.l. 24.42½, c.l. 23.92½; weathterproof, f.o.b. eastern mills, 100,000 lb lots, 25.60, l.c.l. 26.22½; magnet, delivered, c.l. 28.00, 15,000 lb or more 28.25, l.c.l. 28.75.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $18.00 per c.w.t; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $18.00 per cwt. Traps and Bends: List price plus 48%.

ZINC

Sheets, 16.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 15.75c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.75c; over 12-in., 15.75c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c, Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. Avg..	21.774	15.017	14.085	103.000	17.000	38.500	40.000	71.500
Mar. Avg..	23.486	18.825	17.056	103.000	17.000	38.500	40.000	71.500
May 2-5 ..	18.50	14.80–14.85	12.50	103.00	17.00	38.50	40.00	71.50
May 6-7 ..	18.50	13.85	12.50	103.00	17.00	38.50	40.00	71.50
May 9-21 .	18.00	13.85	12.00	103.00	17.00	38.50	40.00	71.50
May 23 ...	18.00	12.85	12.00	103.00	17.00	38.50	40.00	71.50
May 24 ...	18.00	12.85	11.00	103.00	17.00	38.50	40.00	71.50
May 25 ...	17.625	12.85	11.00	103.00	17.00	38.50	40.00	71.50
May 26 ...	17.625	11.85	11.00	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 23.84c; oval 27.84c; cast 26.37c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	15.500	15.500	14.625
Yellow brass	13.250	13.000	12.500
Commercial Bronze			
95%	14.625	14.375	13.875
90%	14.500	14.250	13.750
Red Brass			
85%	14.375	14.125	13.625
80%	14.250	14.000	13.500
Best Quality (71-80%)	14.125	13.875	13.375
Muntz Metal	12.625	12.375	11.875
Nickel, silver, 10%	15.125	14.875	7.5625
Phos. bronze, A	17.375	17.125	16.125
Naval brass	13.125	12.875	12.375
Manganese bronze	13.125	12.875	12.250

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 13.00, No. 2 copper 12.00, light copper 11.00, composition red brass 10.00, radiators 7.75, heavy yellow brass 7.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.00, No. 2 copper 12.00, light copper 11.00, refinery brass (60% copper), per dry copper content 10.50-11.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 11.75-12.00, No. 2 10.75-11.00, light copper 9.75-10.00, No. 1 composition red brass 8.50-9.00, No. 1 composition turnings 8.00-8.50, mixed brass turnings 6.25-6.50, new brass clippings 10.50-11.00; No. 1 brass rod turning 7.50-7.75, light brass 5.25-5.75, heavy yellow brass 6.50-6.75, new brass rod ends 7.50-7.75, auto radiators, unsweated 6.25-6.50, cocks and faucets 7.75-8.00, brass pipe 8.00-8.25.

Lead: Heavy 7.50-8.00, battery plates 3.75-4.25, linotype and stereotype 10.50-11.00, electrotype 8.50-9.00, mixed babbitt 10.50-11.00, solder joints, 10.50-11.00.

Zinc: Old zinc 3.75-4.25, new die cast scrap 3.50-4.00, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00, siphon tops 44.00-46.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 6.00-6.50, crankcase 6.00-6.50, borings and turnings 3.00-3.50, pistons, free of struts, 6.00-6.50.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt	$23.00
No. 2 Heavy Melt	21.00†
No. 1 Busheling	23.00
No. 1 Bundles	23.00
No. 2 Bundles	19.50-20.50
No. 3 Bundles	18.50-19.50
Heavy Turnings	18.00-19.00
Machine Shop Turnings	14.50-15.50‡
Mixed Borings, Turnings	14.50-15.50‡
Short Shovel Turnings	18.50-19.00
Cast Iron Borings	18.50-19.50
Bar Crops and Plate	25.00-25.50
Low Phos. Steel	25.00-25.50

Cast Iron Grades†

No. 1 Cupola Cast	23.00-23.50
No. 1 Machinery Cast	28.00-29.00
Charging Box Cast	25.50-26.50
Heavy Breakable Cast	24.00-25.00
Brake Shoe	25.00-26.00

Railroad Scrap

No. 1 R.R. Heavy Melt	25.50-26.00
Axles	33.00-34.00
Rails, Random Lengths	28.00-29.00*
Rails, 2 ft and under	33.00-34.00
Rails, 18 in. and under	35.00-36.00
Railroad Specialties	28.00-28.50
Angles, Splice Bars	35.00-36.00

†Offering price.
*Brokers' buying prices.
‡Crushers buying prices.

CLEVELAND

Heavy Melt. Steel	$18.00-19.00
No. 1 Busheling	18.00-19.00
No. 2 Bundles	16.00-17.00
Machine Shop Turnings	12.00†
Mixed Borings, Turnings	17.50-18.00
Short Shovel Turnings	17.50-18.00
Cast Iron Borings	17.50-18.00
Bar Crops and Plate	22.00†
Punchings & Plate Scrap	22.00†
Cut Structurals	23.00†

Cast Iron Grades†

No. 1 Cupola	29.00-30.00
Charging Box Cast	27.00-28.00
Stove Plate	23.00-24.00
Heavy Breakable Cast	21.00-22.00
Unstripped Motor Blocks	21.00-22.00
Malleable	23.00-24.00
Brake Shoes	22.00-22.50
Clean Auto Cast	32.00-32.50
No. 1 Wheels	27.00-28.00
Burnt Cast	20.00-21.00

Railroad Scrap

No. 1 R.R. Heavy Melt	24.00-25.00
R.R. Malleable	23.00-24.00†
Rails, 3 ft and under	32.00-33.00
Rails, Random Lengths	26.00-27.00
Cast Steel	28.00
Railroad Specialties	28.00
Uncut Tires	24.00
Angles, Splice Bars	29.00-30.00

† Nominal.

VALLEY

Heavy Melt. Steel	$22.00†
No. 1 Bundles	22.00†
No. 2 Bundles	19.00†
Machine Shop Turnings	13.50-14.00†
Short Shovel Turnings	18.50-19.00†
Cast Iron Borings	18.50-19.00†
Low Phos.	24.50-25.00†

Railroad Scrap

No. 1 R.R. Heavy Melt	25.00-26.00

† Nominal.

MANSFIELD

Machine Shop Turnings	$13.50-14.00†
Short Shovel Turnings	17.50-18.00†

† Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$21.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	18.00
Machine Shop Turnings	10.00
Mixed Borings, Turnings	10.00
Short Shovel Turnings	10.00
Cast Iron Borings	11.00

Cast Iron Grades

No. 1 Cupola Cast	28.00
Charging Box Cast	22.00
Heavy Breakable Cast	20.00
Stove Plate	17.00
Unstripped Motor Blocks	16.00
Brake Shoes	17.00
Clean Auto Cast	28.00
Drop Broken Cast	31.00

Railroad Scrap

No. 1 R.R. Heavy Melt	21.00
R.R. Malleable	20.00
Rails, Rerolling	25.00
Rails, Random Lengths	22.00
Rails, 18 in. and under	32.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles	$15.50-16.00
No. 2 Bundles	12.50-13.00
No. 2 Heavy Melt. Steel	13.00-13.50
No. 1 Busheling	15.50-16.00
Machine Shop Turnings	11.00-12.00
Mixed Borings, Turnings	11.00-12.00
Short Shovel Turnings	12.00-13.00
Cast Iron Borings	13.00-14.00
Punchings & Plate Scrap	15.50-16.00

Cast Iron Grades

No. 1 Cupola Cast	22.00-24.00
Heavy Breakable Cast	17.00-19.00
Clean Auto Cast	22.00-24.00

BUFFALO

No. 1 Heavy Melt. Steel	22.00-22.50
No. 2 Heavy Melt. Steel	19.50-20.00
No. 1 Bundles	19.50-20.00
No. 1 Bushelings	19.50-20.00
No. 2 Bundles	17.50-18.00
Machine Shop Turnings	13.00-13.50
Mixed Borings, Turnings	15.00-16.00
Cast Iron Borings	15.00-16.00
Short Shovel Turnings	16.00-17.00
Low Phos.	23.00-23.50

Cast Iron Grades

Mixed Yard Cast	27.00-28.00
Heavy Breakable	25.00-26.00
Malleable	23.00-24.00
Clean Auto Cast	31.00-32.00

Railroad Scrap

Rails 3 ft. and under	33.00-34.00
Scrap rails	28.00-29.00
Rail specialties	28.50-29.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	$21.50
No. 2 Heavy Melt. Steel	19.00-19.50
No. 1 Busheling	19.50
No. 1 Bundles	21.50
No. 2 Bundles	17.00-17.50
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	11.00-12.00
Short Shovel Turnings	15.00-16.00
Bar Crop and Plate	24.00-25.00
Punchings & Plate Scrap	24.00-25.00
Cut Structurals	24.00-25.00
Elec. Furnace Bundles	21.50-22.00
Heavy Turnings	21.50
No. 1 Chemical Borings	Nom.

Cast Iron Grades

No. 1 Cupola Cast	26.00-27.00
No. 1 Machinery Cast	28.00-29.00
Charging Box Cast	27.00-28.00
Heavy Breakable Cast	27.00-28.00
Unstripped Motor Blocks	22.50-23.00
Clean Auto Cast	28.00-29.00
No. 1 Wheels	29.00-30.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$15.50-16.00
No. 2 Heavy Melt. Steel	12.00-13.00
No. 1 Busheling	12.00-13.00
No. 1 Bundles	15.50-16.00
No. 2 Bundles	13.00
No. 3 Bundles	nominal
Machine Shop Turnings	5.00-7.00
Mixed Borings, Turnings	5.00-6.00
Short Shovel Turnings	7.00-8.00
Punchings & Plate Scrap	19.00-20.00
Cut Structurals	nominal
Elec. Furnace Bundles	19.00-20.00

Cast Iron Grades

No. 1 Cupola Cast	20.00-21.00
No. 1 Machinery	21.00-22.00
Charging Box Cast	18.00-18.50
Heavy Breakable	18.00-18.50
Unstripped Motor Blocks	nom.
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$14.00-15.00
No. 2 Heavy Melt. Steel	11.50-12.50
No. 1 Bundles	12.50-13.50
No. 1 Busheling	10.00-11.00
Machine Shop Turnings	5.50-6.50
Mixed Borings, Turnings	5.50-6.50
Short Shovel Turnings	9.50-10.00
Bar Crops and Plate	16.00-17.00
Punchings & Plate Scrap	16.00-17.00
Chemical Borings	11.00-12.00

Cast Iron Grades

No. 1 Cupola Cast	19.00-20.00
Mixed Cast	18.00-19.00
Heavy Breakable Cast	17.00-18.00
Stove Plate	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	$21.00-22.00
No. 2 Heavy Melt. Steel	19.00-20.00
No. 1 Bundles	21.00-22.00
No. 2 Bundles	18.00-19.00
No. 3 Bundles	14.00-15.00*
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings	15.00-16.00
Cast Iron Borings	13.00-14.00
Bar Crops and Plate	22.00-23.00
Punchings	22.00-23.00
Elec. Furnace Bundles	21.50-22.50
Heavy Turnings	19.50-20.50
Cut Structurals	22.00-23.00

Cast Iron Grades*

No. 1 Cupola Cast	27.00-28.00
Clean Auto Cast	27.00-28.00
No. 1 Wheels	27.00-28.00

Railroad Scrap

No. 1 R.R. Heavy Melt	22.00-23.00
Malleable	22.00-23.00
Rails, Rerolling	27.50-28.00
Rails, Random Lengths	22.00-23.00
Rails, 2 ft. and under	28.00-29.00
Rails, 18 in. and under	29.00-30.00
Railroad Specialties	24.00-25.00
Angles, Splice Bars	24.00-25.00

* Nominal.

ST. LOUIS

No. 1 Heavy Melt. Steel	$21.00-22.00
No. 2 Heavy Melt. Steel	19.00-20.00
Machine Shop Turnings	13.00-14.00
Short Shovel Turnings	13.00-14.00

Cast Iron Grades

No. 1 Cupola Cast	26.00-28.00
Charging Box Cast	20.00-22.00
Heavy Breakable Cast	19.00-21.00
Brake Shoes	22.00-23.00
Clean Auto Cast	28.00-29.00
Burnt Cast	22.00-23.00

Railroad Scrap

R.R. Malleable	21.00-23.00
Rails, Rerolling	25.00-26.00
Rails, Random Lengths	21.00-22.00
Rails, 3 ft. and under	27.00-28.00
Uncut Tires	23.00-24.00
Angles, Splice Bars	26.00-27.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	22.00
No. 2 Bundles	20.00
Long Turnings	20.00
Short Shovel Turnings	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	25.00-26.00
Cut Structurals	25.00-26.00

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Stove Plate	30.00-31.00
No. 1 Wheels	30.00-31.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	24.00
R.R. Malleable	nominal
Rails, Rerolling	30.00-32.00
Rails, 3 ft. and under	31.00-32.00
Angles and Splice Bars	31.00-32.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
Machine Shop Turnings	12.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelings	17.00
Nos. 1 & 2 Bundles	15.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	20.00
Cut Structurals	20.00

Cast Iron Grades

No. 1 Cupola Cast	25.00
Heavy Breakable Cast	20.00-22.00
Stove Plate	25.00
Unstripped Motor Blocks	20.00
Malleable	25.00
Brake Shoes	25.00
Clean Auto Cast	25.00
No. 1 Wheels	25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	22.00
Rails, Random Lengths	22.00
Angles and Splice Bars	22.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	28.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	48.00
No. 2 Cast	44.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

NEW CANNON FOR OLD

A great need for scrap was manifested after the war of 1812. Condemned cannons were sold to foundries to be scrapped and exchanged for more modern types. At a public auction in 1824—73,000 pounds of scrap iron and surplus cannon were sold at one frontier town.

The government is still a very large source of scrap iron and steel. Luria Brothers & Company, Incorporated, play a vital part in delivering government scrap to mills as it becomes available. Our fifteen strategically located offices are constantly at your service.

CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

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BUFFALO, N.Y. Genesee Bldg.	DETROIT, MICH. 2011 Book Bldg.	NEW YORK, N.Y. Woolworth Bldg.	READING, PA. Luria Bldg.
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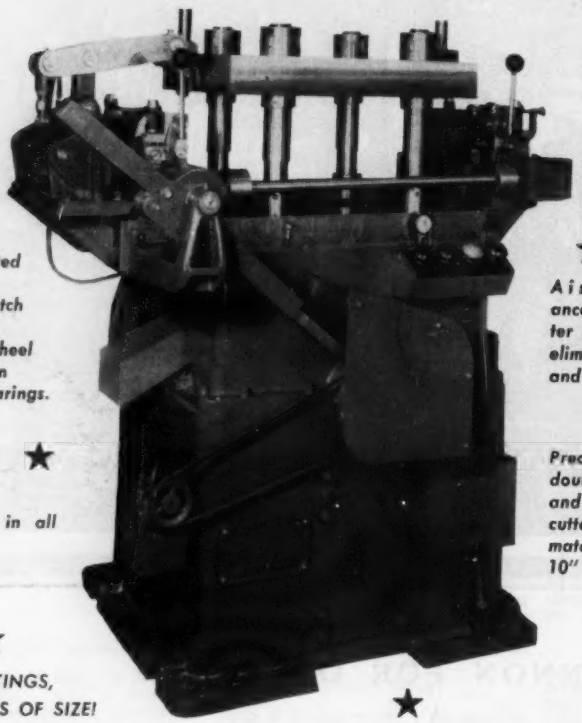
LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Presenting some of the reasons why plants using BRANDES PRESSES enjoy cost reduction through continuous high production, longer runs between grinds, longer die life and sturdier dies.

Simply check a few of these features, translate them into terms of cold efficiency, and then ask yourself if you can afford to neglect checking up on our claims.

BRANDES 30-TON AUTOMATIC PRESS

Larger bed area, 20" x 31". ★



★ Conventional working height.

★ Air counterbalance and low center of gravity eliminates slap and vibration.

★ Precision double roll feed and rigid scrap cutter for material up to 10" in width

★ Air operated disc type friction clutch and brake with fly wheel mounted on Timken Bearings.

★ Automatic lubrication in all machines.

★ NO GROUTINGS, REGARDLESS OF SIZE! This exclusive feature of the Brandes Press brings savings on special foundations. Press is easily moved and installed because there are no moving parts or projections under the base.

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BRANDES PRESSES have been in production in a number of America's greatest plants during the past ten years. They are designed and built to represent a solid investment, and one of our greatest sales points is the fact that they pay continuous dividends. If you care to forward blueprints or parts scheduled for progressive die work, we will be pleased to submit estimates on production speed, etc. There are many ways in which Brandes 30-750 TON PRESSES can reduce your costs. Let us tell you about them, may we?

THE BRANDES PRESS CO.

6408 EUCLID AVE., CLEVELAND 3, O.

Sheets, Strip . . .

Price of cold-rolled strip reduced 25c per 100 lb by Detroit producer

Sheet Prices, Page 102

Detroit—Detroit Steel Corp. has reduced its price of cold-rolled strip steel 25 cents per 100 pounds to the basis of $4.25, f.o.b. Detroit mill, effective as of May 23, according to Howard V. Clark, vice president in charge of sales. For shipments from its eastern mill at New Haven, Conn., the price is unchanged at $4.50 per 100 lb.

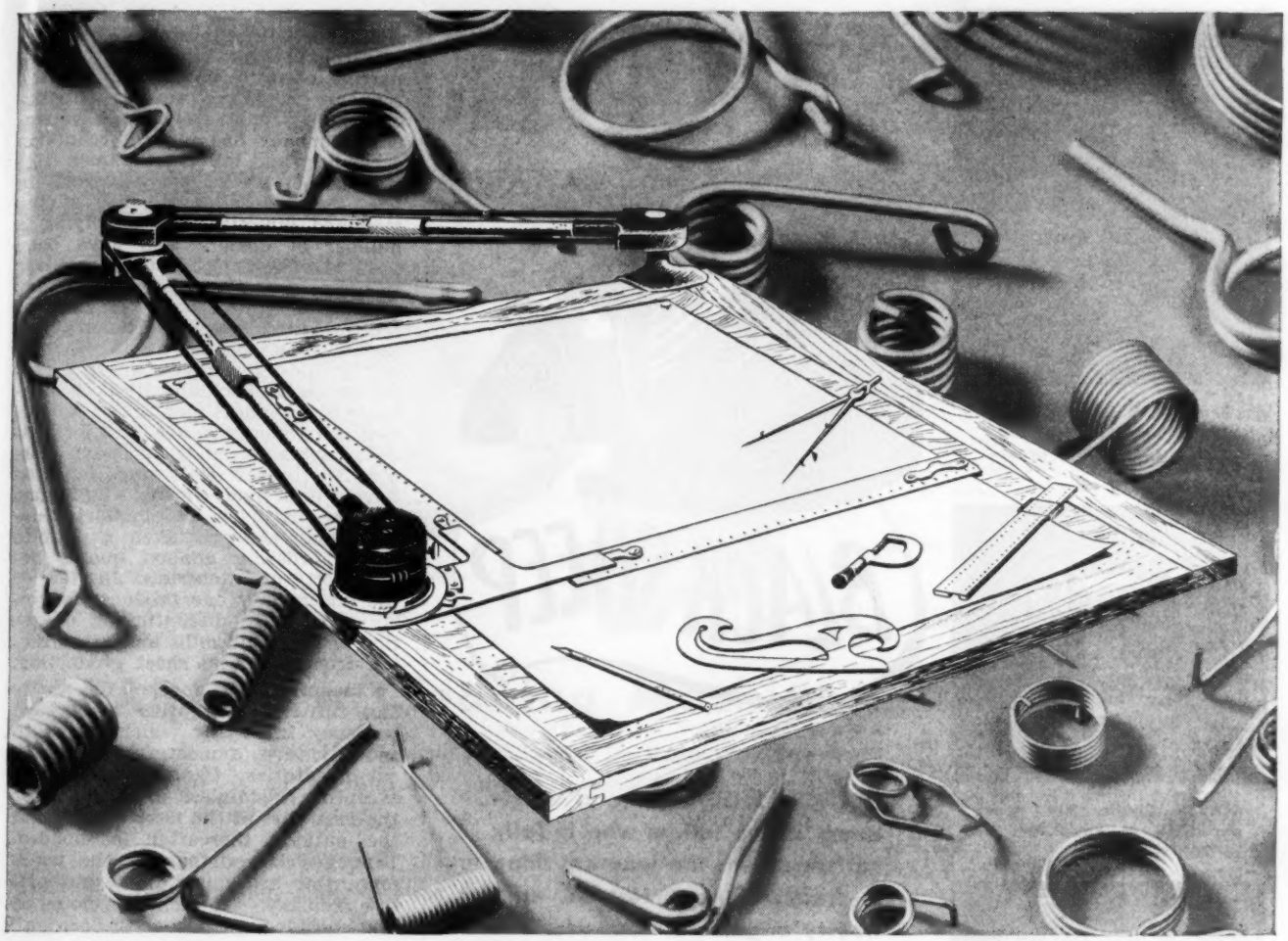
Boston—More users of flat-rolled are sounding out suppliers as to steel commitments, covering size, grade, cost and delivery, when bidding for potential fabricated end-use products and shipment is frequently a controlling factor in placing orders. Forward buying remains slack and, with backlogs falling, less firm tonnage will be available for third quarter mill scheduling. Most steel consumers are returning to prewar buying policy and some, for the moment, are even more conservative. So many uncertain factors loom, from mine to end-use of finished steel products, this cautious buying trend is likely to extend well into, if not through, third quarter. Buying indications point toward covering on actual requirements, depleting inventories further and keeping close tab on costs and delivery.

New York—Sheet sellers now have relatively little to offer for the remainder of this quarter, as the lead time on all major grades has expired. However, due to deferments and some further cancellations, they are able to supply some tonnage. Also, they can draw upon growing accumulation of overages for certain specifications. Mills are actively soliciting tonnage for third quarter, with consumers showing only moderate interest, except perhaps in galvanized sheets and in a somewhat lesser degree in cold-finished sheets. Specialties, such as electrical and stainless sheets, are moving decidedly slowly.

Philadelphia—Sheet consumers report continued difficulty in obtaining galvanized sheets and also say that cold-rolled sheets are none too plentiful. However, as for the latter, they can be had within five weeks provided consumers wish to go far enough afield and absorb the extra freight rate involved. Hot-rolled sheets, electrical sheets, and stainless sheets are degrees easier in that order. The Ford Motor strike is reflected in some deferments in this district.

Carnegie-Illinois Steel Corp. on May 25 announced a decrease in the price of galvanized sheets $1.50 a ton because of a drop of 1 cent a pound in the price of zinc. This is in accordance with the standard formula of adjusting galvanized product prices whenever the price of zinc changes.

Chicago—Temporarily, at least, there is evidence of some recovery in depressed household appliance lines manufacturing. Makers of the lower price lines are apparently the



BLANK PAPER . . . and an Idea

THE DESIGN of a satisfactory spring involves innumerable factors—load, deflection, size, shape, finish—to mention a few. Having determined these requirements, Wickwire Spencer engineers begin—with brains and blank paper—to establish the proper relationship between these factors and to design a spring that will stand up under the service requirements demanded.

The same exacting care that characterizes the design of springs and wire forms, is equally true as far as manufacturing procedures are concerned. Every coil of wire used in making springs undergoes exhaustive tests before manufacture. Skilled toolmakers set up machines that make springs conform to exacting specifications. And finally, the springs are tested before shipment.

This beginning-to-end-control has saved time, trouble and expense for scores of manufacturers—has won many loyal customers for us. Our engineers are at your service in designing any conceivable type of wire spring or wire form. Why not write us? Also, we would like to send you our free book, "Springs and Formed Wires." It's free—and full of valuable data relating to spring selection and performance. Address your request to Spring Dept., Wickwire Spencer Steel Division of C. F. & I., 2 New Bond St., Worcester 6, Mass.

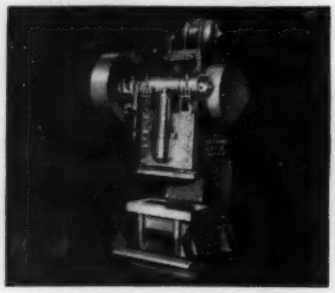
CF&I WICKWIRE SPENCER SPRINGS

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

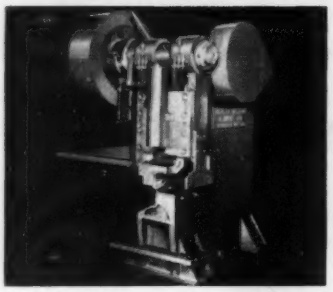
SPRING SALES OFFICE & PLANT—2 New Bond St., Worcester 6, Mass. • EXECUTIVE OFFICE—500 Fifth Ave., N. Y. 18, N. Y.
SALES OFFICES—Boston•Buffalo•Chicago•Denver•New York•PACIFIC COAST—The California Wire Cloth Corp., Oakland 6, Cal.

Other Quality Wickwire Spencer Products include: Wire, Wire Rope, Metal Conveyor Belts, Chain Link Fence, Industrial Wire Cloth, Poultry Netting, Hardware Cloth, Insect Wire Screening, Welded Wire Fabric for concrete reinforcement

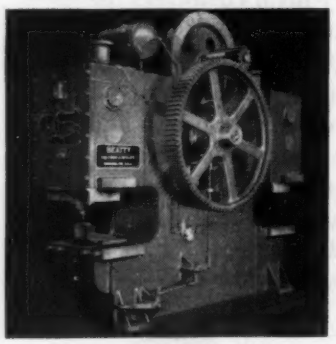
BEATTY 250-ton Gap Type Press for forming, bending, flanging, pressing.



BEATTY Single End Punch available in capacities up to 200 ton.



BEATTY Single End Bar Shear available in capacities up to 300 ton.



BEATTY 200 ton Double End Toggle Punch.

"BLACK SHEEP" among engineers is the fellow who is *fully* satisfied with the way *anything* is being done. Not so with Beatty engineers! Our motto is that, "There's a better way to do it." And we have helped find that better way for hundreds of heavy metal working operations — punching, coping, shearing, forming, pressing, flanging, extruding, V-bending. Our broad problem-solving experience qualifies us to make expert recommendations on your problem, no matter how intricate. If you have a specific problem, if you are not fully satisfied with present production, call us in. We may very well have the answer.

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

BEATTY MACHINE AND MFG. COMPANY
HAMMOND, INDIANA

chief beneficiaries of the improvement, one kitchen cabinet and steel wardrobe maker reporting that department store promotions of the economy lines have prevented any decline in its sales volume. A refrigerator maker has upped production schedules, and stove companies, too, report better sales; however, in one case, at least, the pickup stemmed directly from supplying a number of dealers who have been added to its outlet list in the last 60 days. It was said that 75 per cent of the company's orders were accounted for in this way. Steelmakers here say it is a toss-up as to whether hot or cold-rolled sheets are in greatest demand; bookings of both continue full for next month and conversion arrangements are still in evidence, some extending into next quarter. No further deals were reported having been made during May by one finisher, however. Third quarter demand has not yet taken a definite shape, ordering against quotas being spotty and uncertain. In view of the uncertainty one producer is giving thought to discontinuing operation of two hand mills and withdrawing from electrical sheet production.

Cincinnati—The market for sheets has turned quiet, with a laggard tendency in buying which seems to reflect desire of most fabricators to cut inventories. Capacity operations, excepting in stainless, are assured for the first part of the next quarter but the outlook thereafter is clouded. Tonnages larger than in the usual proportion are going to the automotive industry. No pickup is noted in household equipment needs.

Birmingham—Sheets continue to hold the demand lead in this territory with considerable insistence for deliveries, especially in roofing and and the lighter gages of manufacturers' sheets. Reports are that backlogs have dwindled little over the past several weeks even with admittedly spotty general business conditions. Barrel and baling strip is being produced in fair tonnage.

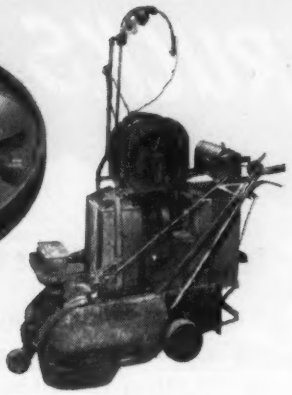
St. Louis—Sheet demand continues firm with order books filled through the third quarter. Demand for galvanized roofing, a major rolling mill product here, is especially strong. Local talk of downward revisions in sheet prices or extra charges has dwindled, pending clarification of the outlook for an industry-wide steel wage increase.

Los Angeles—Mills generally are continuing full schedules on flat-rolled products, despite the fact it now takes a good deal more selling to fill order books. Nevertheless, demand for sheet remains strong, and a little more optimism is evident among fabricators. After months of exceptionally depressed activity, sheet requirements of water heater, stove, and domestic furnace manufacturers are picking up substantially. Makers of home cooling systems continue to be an outlet for a considerable tonnage.

San Francisco—Demand for sheets continues to drop as fabricators show no let-up in policy of buying only for immediate needs. Users are showing little interest in future commitments. No buying uptrend is anticipated until prices are reduced or unless general business conditions improve.

METAL CLEANING *News*

Profitable Ideas That Work with WHEELABRATOR Airless Blast Cleaning



Above: Miscellaneous parts of a scrubbing machine after Wheelabrating.

At right: A Finnell floor maintenance machine prior to reconditioning.

CLEANING a Cleaning Machine

Periodic reconditioning of floor cleaning machines, by thorough cleaning and readjustment, is an essential part of the nationally known Finnell System of floor maintenance.

For many years the first step in the process—removing rust, scale, old paint and other foreign material—was accomplished by wire brushing—a laborious, time-consuming job that took a full eight hours. Installation of a 66" Wheelabrator Swing Table cut the time on this operation to less than one hour. Result: Labor costs reduced 90%; production rate increased 700%.

Avoiding Pipe Line Leakage

The high pressures, which send the nation's oil surging through thousands of miles of pipe line, is sufficient to spring serious leaks if the lines are weakened by rust or corrosion. Wheelabrating has helped the pipe line operator to solve this problem both in the case of new pipe and in the case of old pipe which has been taken up and relaid.

The thorough cleaning and slight roughening action of the abrasive blast provides an immensely better bond for the protective coating. In the case of old pipe, the abrasive blast scours away every trace of dirt and scale from the surface and reveals the true condition of pits and other defects.

A New Face For Cold Reduction Rolls

Tennessee Coal Iron & R. R. Co. reports a 35% increase in the service life of their cold reduction rolls since the installation of their new Wheelabrator roll dressing machine. Completely automatic in operation, the machine requires no special skill or judgment on the part of the operator and the resulting roughening is extraordinarily deep and uniform, even for the hardest rolls. Using one Wheelabrator unit, the actual blasting time is 3 minutes per roll, as compared to 20 minutes by airblasting.

Coffee-maker Maker Gets Production Percolating

In the manufacture of a stainless steel wire grid assembly, for use in commercial coffee-makers, a lead coating deposited on the part must be completely removed before the grid is incorporated in the finished product. To do this quickly and thoroughly the Hunter Pressed Steel Co. of Lansdale, Pennsylvania, uses a 27" x 36" Wheelabrator Tumblast. After cleaning, the grids are passivated to prevent corrosion.

Steel Drums Go To The Cleaners

Paint, rust and old coatings are removed from 120 to 200 steel drums hourly in a Wheelabrator Cabinet at Acme Drum Co., Chicago, Illinois, a commercial drum "laundry". Wheelabrating removes all of the paint and rust from interior and exterior surfaces at the rate of one drum every 9 to 12 seconds depending upon their condition, at substantial cost and time savings.

Copper Shot Now Available

Long awaited by the producers of brass and bronze castings, copper shot is now available for use in blast cleaning equipment. Brass and bronze castings Wheelabrated with copper shot have a more natural finish and a brighter appearence. Early tests indicate that cleaning costs can be materially reduced with this new abrasive.

Eliminating Acid Pickling

The use of Wheelabrating instead of pickling has shown many advantages, and is receiving widespread acceptance. It solves the waste pickle liquor disposal problem and eliminates the possibility of defects such as pitting, smut formation and hydrogen embrittlement. The matte surface produced insures an excellent bond for plating, galvanizing, enameling, and similar finishes.

The Wheelabrator Method of Airless Blast Cleaning

"Wheelabrating" is a simple mechanical method of abrasive blasting in which abrasive is fed through a control cage to the center of the bladed "Wheelabrator" wheel which rotates at high speed. By centrifugal force the abrasive is thrown from the wheel, under careful directional control, upon the product being cleaned or finished. For complete information write for Catalog 74-A.

American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka 5, Indiana

Manufacturers of: WHEELABRATOR® Airless Abrasive Blast Equipment

Warehouse handling 3,832,939 lbs. of stores per month uses BAKER TRUCKS

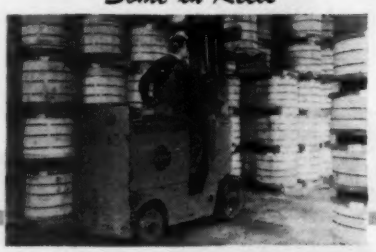
STOCK COMPRISES 3700 DIFFERENT ITEMS—

Some in Barrels

Some in Cartons

Some in Crates

Some in Reels



Take a look at these figures:

This utility company warehouse has a total storage space of 177,220 sq. ft.—all but 25,000 sq. ft. under roof. An average of 3,832,939 lbs. of stores are handled per month—comprising 3700 different items, including pole line hardware, wire, transformers, etc.—with average stock value of $1,051,984.00. Deliveries in unit loads from general storeroom to 38 outlying stores average 1,014,000 lbs. per month.

To facilitate this handling job, the company uses 2 Baker Trucks. One, an old platform truck still giving daily service, is 23 years old. The other, a 4000 lb. Fork Truck (illustrated), was purchased more recently. It is saving time and cutting costs in loading, unloading and high-tiering.

If your handling problem is large or small, complicated or simple, a Baker Material Handling Engineer can help you.

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Co.
1259 West 80th St., Cleveland 2, Ohio
In Canada: Railway & Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

Stainless Sheet Extras Cut

Washington, Pa. — Washington Steel Corp. has made substantial reductions in the price of light gage stainless steel sheet. Gage extras are reduced on 27 gage through 36 gage, resulting in savings in purchase price of the material from 11.66 per cent to 26.67 per cent per square foot or per sheet.

According to John C. Richards, general manager of sales, the company's new method of cold rolling stainless sheets permits economies in manufacture that the corporation feels should be passed on to the fabricator.

The action was taken also to stimulate demand for the wide stainless sheets in narrower gages, which formerly were priced on heavier gage bases and projected at the rate of about 6 cents per square foot for the thinner gages. The company's new stainless sheet gage extras per pound are as follows: 27 gage, 10 cents; 28 gage, 12 cents; 29 gage, 17 cents; 30 gage, 22.5 cents; 31 gage, 30 cents; 32 gage, 39 cents; 33 gage, 46.5 cents; 34 gage, 55 cents; 35 gage, 66.5 cents; 36 gage, 82.5 cents.

Stainless Steel . . .

Stainless Steel Prices, Page 103

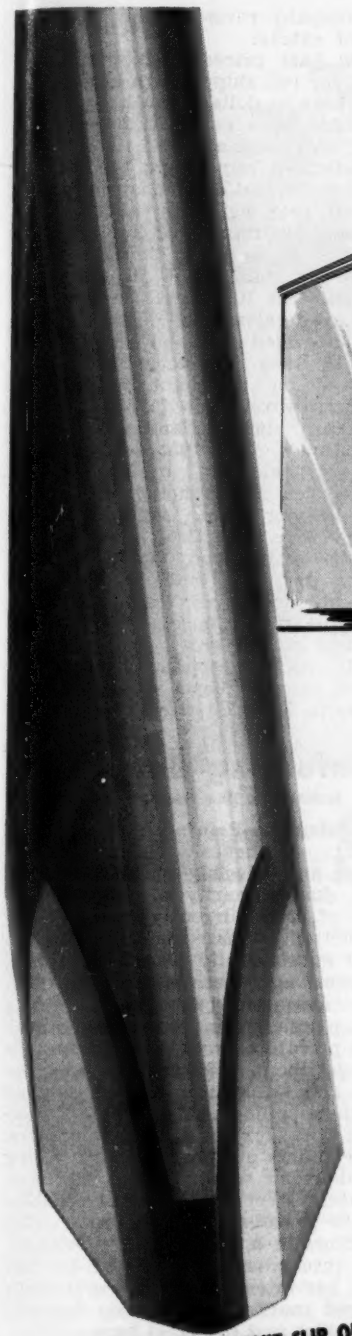
Pittsburgh—New demand for stainless sheets and strip has failed to record expected improvement this spring, although new tonnage volume is better relatively than for alloy products as a whole. Stainless items can be obtained within range of two to four weeks, with exception of bar sizes under ½-inch, for which delivery promises are extended six to seven weeks.

Steel Bars . . .

Bar Prices, Page 102

New York—Demand for hot carbon bars continues to ease, with most sellers still in position to furnish some tonnage against new orders for shipment before the end of this quarter. This situation applies in even greater degree to cold-drawn carbon bars. Some cold drawers estimate that their shipments in June will be down 40 to 50 per cent from what they were at the beginning of the year. Efforts to build up backlogs for third quarter are meeting with only moderate success. As a matter of fact, most bar sellers look for little improvement in activity before late summer or early fall. Alloy bar demand continues to drag, with deliveries available within four to five weeks.

Boston—That carbon bar inventories, notably cold-finished, were heavier than estimated in popular sizes, is indicated by limited buying for spot requirements and absence of forward orders beyond this quarter. Most bar users are operating substantially below peak and are drawing on reserves. Cold-drawing operations reflect this slack and the trend filters down to hot-rolled to some extent. Revisions in order status have subsided with most consumers and end result presents a



4-WINGED DRIVER CAN'T SLIP OUT OF PHILLIPS TAPERED RECESS

FOR A SHARPER IMAGE OF

TOP PROFITS IN TELEVISION PRODUCTION and SALES

... set-builders use

AMERICAN PHILLIPS SCREWS

SEE NEW PRODUCTION PROFITS: Assembly of costly television sets puts a prohibition on spoilage. That's why American Phillips Screws are used, to help keep sets rolling out to an eager market, and to keep rejections down. No delays or losses, then, and output hits the main channel with highest return per man-hour, *which means time-savings up to 50%!*

SEE NEW SALES-STIMULATION: Smoothly finished, unmarred cabinet work is the basis of television-set sales. And that's the way sets come from an assembly department using *American Phillips Screws.*

Does YOUR product have this double-feature of production-economy and sales promotion? Then write:

AMERICAN SCREW COMPANY, PROVIDENCE 1, RHODE ISLAND

Chicago 11: 589 E. Illinois St. *Detroit 2:* 502 Stephenson Building

AMERICAN PHILLIPS *Screws*

ALL TYPES

ALL METALS: Steel, Brass, Bronze, Stainless Steel, Aluminum, Monel, Everdur (silicon bronze)

different situation than that prevailing at start of current quarter. Considerable carbon bar tonnage is offered by mills outside more favorable freight areas. Alloys are slow and are available in three to four weeks. Large consumers in some cases cut back orders sharply on carbon bars for May and part of June.

Watertown arsenal closes June 9 on one of its largest postwar inquiries, 706 tons of bars.

Los Angeles—Backlogs of several bar producers have virtually disappeared. These mills have reduced production, operating on an order basis and subject to rolling schedules. Bar mills generally are rolling some products which they have not turned out for several years, in their effort to supply any item for which there is demand. Cold-finished bars are a particularly soft spot in the market, reflecting sharply lowered requirements of screw machine shops. One bar mill, whose stock of semi-finished steel is abnormally large, has shut down two of its four open hearths.

Atlantic Steel Cuts Prices

Atlanta—Atlantic Steel Co., this city, has reduced prices $1 to $18 a ton, effective as of May 16, on merchant wire products, merchant bars, bar size angles, hot-rolled strip and reinforcing bars. At the same time the company revised some of schedules of extras.

New base prices, f.o.b. plant, Atlanta, for rail shipment in carlots are as follows in dollars per 100 pounds: Merchant bars and bar size angles, $3.50; hot-rolled strip, $3.40; new billet deformed reinforcing bars, $3.50.

The hot-rolled strip extra list dated Dec. 20, 1948, has been canceled. The company has reinstated the list dated Jan. 1, 1948, in which the size extras are lower than those in use since Dec. 20. The 10 per cent increase for hot-dipped galvanizing of bars, shapes and hot-rolled strip, effective as of Aug. 16, 1948, is canceled.

Prices on merchant trade wire products were revised to the basis, f.o.b. cars, plant, Atlanta: Wire nails and staples, Col. 105; barbed wire, Col. 125; bale ties, single loop, Col. 107; woven wire fencing, 15½ gage and heavier, Col. 111; merchant quality wire, annealed, $4.95 per 100 pounds, galvanized, $5.40. These prices are for rail shipment in straight or mixed carloads, with transportation charges for the account of purchaser.

All orders accepted will be invoiced on the basis of prices and extras in effect at time of shipment.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 102

Pittsburgh—Reinforcing bar sellers expect shipments this year will match and possibly exceed those in 1948, due primarily to greater tonnage of steel currently available for production of that product. Demand is off substantially from a year ago, however, and there is growing tendency among fabricators to quote firm prices on inquiries originating from private sources. Recent awards include about 1000 tons of concrete bars and an additional like tonnage of sheet piling to Carnegie-Illinois Steel Corp. for the Mellon bank here. Some sellers are offering sheet piling for delivery within 60 to 90 days. Greater steel supply has enabled sellers to substantially reduce order backlogs in a short time. Competitive prices recently quoted by rail steel bar interests has not materially altered market relationship between new billet and rail steel bars.

Los Angeles—With the exception of several large-scale multiple-unit housing projects and a limited amount of industrial building, demand for reinforcing bars currently is dependent upon public construction. Latter, however, is at record levels, and is keeping requirements for reinforcing at fair volume. The state of California alone has a long-range building program amounting to $300 million with some $137 million of that in current projects.

Seattle—Mill estimating staffs are overworked with a heavy volume of construction jobs involving small tonnages of reinforcing bars, 20 to 50 tons each for industrial plants, schools and other projects. Public works are still absorbing the heavier tonnages. Mill operations are at full capacity and backlogs of reinforcing bars are stationary, new business equalling output. Demand for merchant bars is not active and the bulk of output is reinforcing.

furnace enclosures engineered like skyscrapers

like a skyscraper . . .

- a structural steel framework, independently supported or attached to existing furnace steel.
- brackets, for tile supports, are fastened to the framework on pre-determined centers.
- refractories are placed on brackets just like books on shelves.

• For proof of the inherent stability of the Bigelow-Liptak unit suspension principle, study the pictures on the right. Repairs are reduced because only damaged or worn tile need be removed; adjacent areas are untouched as no tile bears more than its own weight. Thus, maintenance costs and down time are cut to an economic minimum.

To provide for expansion as well as furnish a sturdy air-tight construction, offset joints are thinly buttered with a special plastic fire clay. This clay joint has a drying shrinkage which compensates for tile expansion under operating temperatures.

Bigelow-Liptak enclosures can be applied to any kind of furnace.

Plus Value Features of Suspended Construction

1. Construction is air tight; heat losses are reduced. Maximum efficiency can be maintained and fuel used to full advantage.
2. Enclosures can be built to any dimension or shape. Temperatures govern wall thicknesses.
3. Refractories are easy to replace without disturbing undamaged sections. Maintenance is simple, quick, economical.
4. B-L engineers coordinate enclosure requirements with problems of temperatures, type of firing equipment, and slagging and erosion possibilities.

A. The standard 7" B-L wall. Note offset construction.
B. The same wall with filler blocks removed to show unit suspension. Cumulative loading is out; repairs simplified.
C. Laying up the 9" double wall. Notice the thin, even joints of plastic fire clay.
D. The completed wall shows how blocks of varying thicknesses fit side by side on horizontal castings.
E. Breaking of joints in the 9" double wall.

PIONEERS OF SUSPENDED CONSTRUCTION FOR INDUSTRIAL FURNACE ENCLOSURES . . .

BIGELOW-LIPTAK
Unit-Suspended Walls + Arches

BIGELOW LIPTAK Corporation

SUBSIDIARY OF A. P. GREEN FIRE BRICK CO.
CURTIS BUILDING • DETROIT 2, MICHIGAN
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BIGELOW-LIPTAK OF CANADA, LTD., TORONTO, ONTARIO

West's Culture Assailed
As Soviet Schools Open
LONDON, Sept. 1—A new school year began in Russia today and Pravda, the Communist party newspaper, exhorted teachers to fill their students with "profound contempt for bowing and scraping before the bourgeois culture of the West."

Dear Soviet Teachers:

We note that you have been discreetly silent on some aspects of the Communist system. And that you have been urged by Pravda to fill your students with "profound contempt" for the admiration given to ours.

May we respectfully suggest a few more things that you'd better keep quiet about if you want the young Russians to grow up convinced Communists.

Don't tell them that in America the opportunity for advancement is unlimited—that here a man can work where he pleases and change his job when he pleases, and that he has the right to organize and bargain collectively.

Don't say anything about the competitive system, with rewards for initiative and enterprise in free markets—the same system which has produced a standard of living about ten times higher than yours.

Don't mention that here people can own things and manage their own businesses . . . and invest money in new undertakings.

Don't breathe a word about the American urge to invent better machines—and more productive ways to use them.

Don't refer to a dynamic way of life that keeps on turning out more and better goods—keeps on lowering costs and raising wages, with shorter working hours.

In other words, don't give them any of the facts about what happens when free people, governing themselves and spurred by ambition, go all-out to build a new kind of country—different from any the world has ever seen.

We don't say our way is perfect—far from it. We still have our ups and downs of prices and jobs. But we *know* what's wrong and we're free to *do* something about it. Change is our middle name. *And in the long run, our system always changes for the better.*

P.S. About that "priority of inventions," the point isn't whether the Russian scientist Lodygin invented electric light before Edison, but what happened *after* it was invented. Which system—yours or ours—has mass-produced for more people the daily benefits of such inventions as the automobile, telephone, radio, refrigeration, central heating, modern plumbing and better farm machinery? The world knows that it is *our* system!

John Q. Public, U.S.A.

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FREE! Send for this valuable booklet today:

In words and pictures, it tells you
—How our U. S. Economic System started
—Why Americans enjoy the world's highest standard of living
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—How mass production began
—How we have been able to raise wages and shorten working hours
—Why more Americans have jobs than ever before
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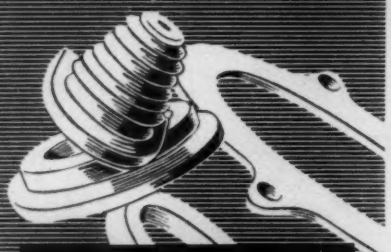

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Structural Shapes . . .

Structural Shape Prices, Page 103

New York—Structural awards locally continue light. However, a fair amount of public work is being actively figured and some fabricators report a quickening interest in private work, although much of it has not as yet reached beyond the preliminary estimating stage.

Army Engineers have approved plans for the proposed world's largest suspension bridge across the Narrows of New York harbor, linking Staten Island with Brooklyn, N. Y. According to plans by the Triboro Bridge and Tunnel Authority, the center span will be 4620 feet long, compared with 4200 feet for the Golden Gate bridge over San Francisco bay, now the world's largest suspension bridge. Recent decision will open the way for the planning of bridge approaches although it may take several years before the crossing can be financed and built.

Pittsburgh—More active competition among structural fabricators is evidenced in reduction in bid prices in recent weeks. Some of these bids on governmental projects have been below engineers' estimates. U. S. Army Engineers have declared that 15 bid openings during the first 22 days in March produced an average of six bidders, and the low bids averaged 7.4 per cent under government estimates. Increased competition for new structural work also has prompted a growing number of fabricators to quote firm prices.

Boston—Bridge inquiry is slightly more active, including 455 tons for Connecticut, but individual projects are small, requiring a minimum of shop fabrication. Public work is also mildly stimulated by school construction, but private building lags. Backlogs are lower and, due to improvement in plain material supply, fabricating shops are generally quoting earlier delivery. Their prices are also lower, reflecting in part a more competitive market. Some states are not only buying structural steel for bridges directly from mills, but also bearing piles and rails as in the case of a 145-foot three-span stringer, Lebanon, N. H.

Philadelphia—The largest reported structural contract in this district involves 325 tons for public utility work in Edgemoor, Del., and it is virtually the only one of any size. Several fair sized projects are pending, but the list involves little new from a week ago. Meanwhile, fabricators continue to reduce backlogs.

Chicago—Shape fabricators' tonnage requirements are slipping but in this district the decline appears to be gradual, order backlogs remaining at a fairly high level. Change in the business climate has been reflected by cancellation of a number of projects, but major fabricators generally continue to hew to their policy of avoiding undesirable jobs. This practice, however, is not so widely followed by small shops, many fiercely competing for the available business, which currently is at low ebb. One competent observer last week remarked that low bids on some jobs have little relation to actual costs, getting the contract being the most important consideration and hoping that a profit can be realized later.

Los Angeles — Fabricators report increased inquiries for structural material, with activity at the best level in recent months. All items now are in ample supply, including wide flange beams from eastern sources. There is considerable surplus inventory on the market, a minor proportion of it being offered at less than mill prices. Substantial tonnages will be required for new shipping facilities to be constructed by Los Angeles harbor in a project totaling $9,153,000.

Seattle—Fabricating plants report normal operations and fair order backlogs. There is steady demand for small tonnages for schools, industrial plants and some public works. Several sizable projects in Alaska are pending and are expected to be placed soon.

Structural Awards Decline

New York—Structural contracts in April of 79,546 tons were the lightest so far this year and brought bookings of the first four months to 487,807 tons. This latter figure is 26 per cent less than for the corresponding months of 1948, but 10.6 per cent greater than the average bookings during the same months in the five pre-war years, 1936-1940 inclusive.

April shipments were 174,073 tons, slightly over 4 per cent greater than for the corresponding month in 1949. Shipments for the first four months of 658,583 tons were 6 per cent greater than for the same period last year.

Backlogs for the next four months only amounted to 628,111 tons as of Apr. 1.

Contract figures for the first three months have also been revised. January, 130,418 tons; February, 180,764 tons; and March, 149,079 tons.

Shipments for the first three months have also been revised. January shipments, accordingly, have been changed to 152,746 tons, February 145,879 tons, and March 185,885 tons.

Wire . . .

Wire Prices, Page 103

Pittsburgh—Jobbers and leading consumers still are inventory conscious and this condition has been accentuated by reports of pending lower prices. Relatively prompt deliveries available from the mills are another factor encouraging customers not to order far ahead, as was the case throughout most of 1948. Sellers are promising basic manufacturers' wire deliveries within three weeks. Some nail sizes still are in fairly tight supply, although this situation is substantially easier than in 1948. Non-integrated mills have had little trouble in obtaining adequate wire rod shipments to sustain currently reduced production schedules. Inventory adjustments continue to retard new demand for barbed wire.

Birmingham—Most wire products are in substantial demand although not as frenzied as a few months ago. Woven fencing and nails, especially, are wanted items.

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Plates . . .

Plate Prices, Page 103

Philadelphia — One district plate mill has taken off another open hearth, reducing the number of active units to three, and another nearby mill, which up until now has been operating at a consistently high rate, is expected to reduce melting operations any day. This reflects the continued decline in plate demand, producers turning out far more tonnage than they are booking, thereby reducing unfilled business. Some mills now have only a few weeks backlog at best and are still in position to process some tonnage for shipment before the end of June.

Contributing to slackening demand are reduced railroad equipment requirements. The Pennsylvania railroad has resumed work on the construction of 2000 heavy duty gondolas, having held up on this program some time ago before it had scarcely gotten under way, but most of the tonnage for this program has already been taken care of.

The Harrisburg, Pa., producer is low on 300 tons of galvanized plate, 3/16 and ¼-inch thick, for the Navy.

New York—Although with only little more than a month remaining, most plate mills can still book some tonnage for delivery before the end of the quarter. Inquiry is, if anything, increasingly spotty and not sufficient to sustain operations at current rates.

Boston—Although plate inventories with consumers are not too heavy in most cases, shop requirements are lower and buying continues spotty for prompt delivery. Improvement in delivery time contributes to this kind of buying with some mills able to make shipments in four to five weeks.

Birmingham—No appreciable tonnage of plates has appeared as the result of slowing down in such lines as car building and ship repairs. Tank production is steady and floor plates are in good demand. Mill output is at or near capacity and there are takers for all the tonnage available.

Seattle—A fair volume of small jobs is reported by plate fabricating shops while several sizable tonnages await placement. As a whole, demand for items involving plates has receded but plants have fair backlogs.

San Francisco—Supplies of lighter gage plates are increasing as demand recedes. The situation in heavy plates still is relatively tight and plans for new pipelines in the West indicate heavy plates will not recede to the present position of other steel products.

Tubular Goods . . .

Tubular Goods Prices, Page 103

Mercer, Pa.—Mercer Tube Co. reduced prices $2 per ton to competitive levels, effective May 23, on standard galvanized pipe ½-inch through 3-inch. This action remedies the ½-point higher discount quoted by industry members.

Pittsburgh — Order backlogs of standard black and galvanized pipe have been largely cleared up in recent months as output continues to exceed incoming orders. Jobbers' stocks are in better balance with few exceptions. Orders for standard pipe booked for third quarter are fairly satisfactory although well below the volume a year ago. Sellers also are accepting orders for fourth quarter delivery.

Tin Plate . . .

Tin Plate Prices, Page 103

Pittsburgh—Easing of restrictions under tin plate orders M-81 and M-43 is expected to make more tin plate available for electrolytic operations. Some containers now made of black plate are expected to be changed over to electrolytic tin plate. This situation should help sustain tin plate operations throughout fourth quarter. Sellers state third-quarter specifications have developed in ample volume to assure active production schedules throughout this period. However, most sellers anticipate substantial reduction in new demand from current levels during final months this year. In previous years, demand for general line containers in fourth quarter has offset the seasonal decline in requirements for perishable food packs. Extent of demand for general line cans for fourth quarter remains the big question mark at the moment, particularly because of the prospect for lower tin plate prices next year.

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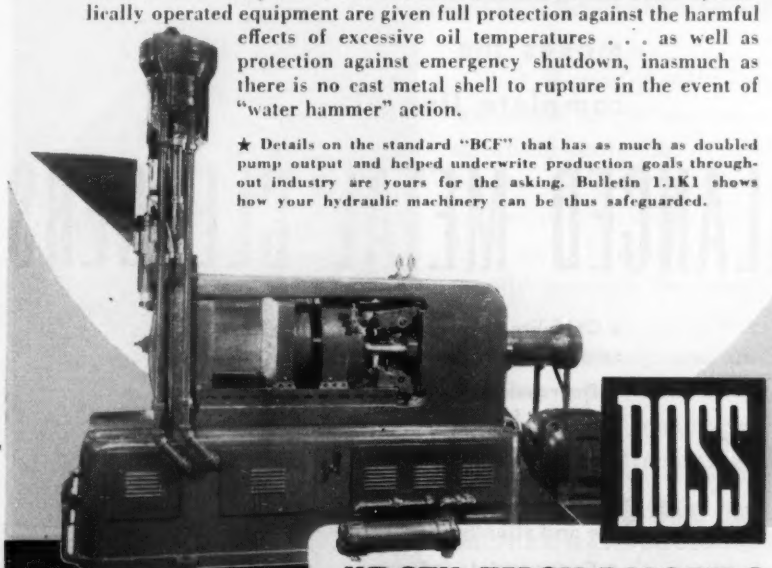

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Pig Iron . . .

Pig Iron Prices, Page 104

Chicago—Difficulties under which most jobbing shops are operating is exemplified by one local foundry. Its melt is down to 40 per cent of capacity, although it is serving the same customers as it did when it was operating at 100 per cent. No one, except the automotive and implement industries, is buying in as great quantities as heretofore. Three reasons can be cited for this: Customers know they can get immediate delivery; some anticipate lower prices; and, of course, many have lower requirements. In view of the desperate plight of some foundry operators it is not surprising that price shading is reported; however, it is said that many of these reductions have been forced on the melt shops rather than initiated by them. Certainly the castings purchaser is in the driver's seat and sometimes holds his order as a big stick to enforce competition. Reduction in cast scrap prices over the last several months has not meant substantial cost savings to most melters, their big inventories having been built up before the price break. Both scrap and iron inventories continue to be worked off and, assuming maintenance of general business conditions at about the present level, it seems likely that both scrap and iron shipments will improve next quarter. Some observers take a less optimistic view, pointing out that the expected spring upturn for many industries did not materialize, which may indicate that the year's output will be off substantially. Furthermore, they are of the opinion that both automobile and farm implement production are past their peaks, and requirements from these directions may ease before other now-depressed industries start an upswing.

Buffalo—Demand for pig iron is losing its zip. Buying continues to fall short of absorbing output. Indications point to a decline in production within the near future as iron is either being piled or placed in warehouses. Melting operations continue to shrink. A leading office equipment caster has reported a drastic slash in output.

New York—District pig iron consumers generally are still drawing upon inventories for the bulk of their requirements and, as their requirements continue limited, new purchases of pig iron remain particularly light. Sellers report sales for the month now closing as being off substantially from those in April. They see little prospect of any material turn for the better much before late summer. Merchant furnaces generally continue to lay down iron and there appears to be little doubt that operations will be reduced on an increasing scale over the next several weeks.

Boston—Pig iron inventories are being worked down slowly due to continued lag in demand for castings. Furnaces normally selling in this area are again seeking volume and most are piling iron. Indications are that no material increase in June melt is likely and shipments that month will remain low. Steel works in some cases are deferring shipments on basic with ingot production down sharply. Some of the largest consumers of foundry grades have reduced melt to levels likely to prevail well into third quarter.

Philadelphia — Downtrend in pig iron business continues, especially in the foundry grades. Most foundries are relying principally on reserve stocks, some of it high priced foreign material which they received some time ago and are anxious to use before again becoming active in the market. Meanwhile, foundry melt is averaging around three to four days operation.

The Chester, Pa., furnace was scheduled to blow out late last week, with substantial stocks on hand for sale to the merchant trade.

Pittsburgh—Demand for merchant pig iron continues in the doldrums, with the lone foundry iron producer here building up inventories for the first time since prewar. While no date has been set, this interest is expected to blow out its blast furnace this summer for necessary repairs. Expected improvement in demand for castings has not yet developed despite price reductions in recent weeks among jobbing shops. Many of these interests are either closed down or operating only three to four days per week. Some shops are attempting to schedule vacations during this period of curtailed operations. A few of the larger foundries apparently have reduced inventories to more workable levels, based on reports that some interests have placed orders for additional iron for the first time in weeks.

Cincinnati — Purchasing of merchant pig iron is slow with little hope for an upturn in the near future. Melters, as they exhaust stocks, order minimum tonnages for quick delivery. A disappointing factor in the market is the slow demand for heating and sanitary equipment in which a seasonal pickup was expected.

Birmingham—Pig iron demand remains somewhat static at the moment with no appreciable pick up over the past week, although merchant iron men say they anticipate improvement within the next two to three months. Large inventories and scrap prices are said to be responsible for the slackening, together with slowed down foundry operations.

St. Louis — Pig iron production here, curtailed to 85 per cent of capacity two weeks ago, has dropped back to between 75 and 80 per cent under the impact of continuing hold-up orders from foundries. Even that rate has permitted stockpiling of 10,000 to 15,000 tons at furnaces. This, however, is considerably under the 40,000 tons furnacemen call the prewar "normal." The demand lag is attributed principally to the fact that customers still are working off their own inventories, some of whom expect to be back in the pig market by the end of June. Some foundries here were stocked heavily with high-priced foreign pig and have been eager to work it off before a cut in their own product prices becomes necessary. Present low state of customer inventories has made most iron producers here optimistic for July.

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Scrap . . .

Scrap Prices, Page 108

Pittsburgh—Major consumers remain out of the market for dealer scrap, although there is some prospect the leading producer may order a representative tonnage before close of the month in an effort to stabilize quotations. Indicated downward trend in steel production schedules, combined with steady influx of industrial scrap with resultant satisfactory inventory position at the mills, continues to take the pressure off requirements for dealer scrap. Dealers claim scrap collections from coal mines and other sources are drying up at present price levels. Yards are accumulating some No. 2 heavy melting at purchase prices ranging from $11 to $11.50 per ton. A few small tonnage offerings of No. 2 heavy melting dealer scrap at $21 have been rejected by the mills. One mill has purchased additional small lot tonnages of No. 1 heavy melting at $23. Previous quotations for turnings and low phos scrap items remain unchanged in absence of new buying. Foundries are expected to remain out of the cast scrap market until present relatively large inventories are brought down to more realistic levels in relation to projected production schedules. Ample merchant iron supply is another factor in this connection. No change in railroad scrap quotations is noted.

Chicago—Purchases of major steelmaking grades by two of the largest district mills during the last ten days brought a better tone to the local scrap market and strengthened the price level. Immediately before the purchases, some brokers were offering tonnages at $1 less than was paid in these two instances, indicating, possibly, that the orders were for larger tonnages than could be obtained at the brokers' former buying price. Warning has repeatedly been sounded in scrap circles that present prices provide insufficient incentive to stimulate scrap flow from remote areas, and the price of the latest purchases, while $2 below last month's levels, may have taken into account the apathy of collectors. Specifically No. 1 heavy melting scrap and bundles were contracted for at $22, No. 2 heavy melting at $20 and machine shop turnings at $13. The No. 1 railroad heavy melting scrap bought by one of these mills carried a delivered price of $23, while the other mill quoted an on-track price of $22, the sale at this price not having taken place at press time. Cast grades continue dormant, and other items on the list are nominally unchanged and largely represent offering prices.

Boston—In absence of substantial buying, scrap prices have declined further on both open-hearth and cast grades. Light buying for district delivery ranges from $14 to $14.50, shipping point, for No. 1 heavy melting with demand for No. 2 and minor grades near standstill. Steel operating rate in New England has slipped far below the national average at 56 per cent of capacity. Cast scrap moves slowly and while some purchasing agents lean toward taking advantage of current low prices, higher management generally favors a policy of working off high-cost inventories first. Mixed cast had sold down to $18.

Philadelphia—Scrap trading continues sluggish, with little to test the market. No. 1 busheling is off slightly to $19.50, delivered, and No. 1 bundles and heavy turnings have declined to $21.50. Steel grades otherwise are unchanged. Cast grades are somewhat easier, with No. 1 cupola cast now generally available at around $26-$27, delivered, and No. 1 machinery cast $28-$29. Unstripped motor blocks are off nominally to $22.50-$23 and clean auto cast to $28-$29. Charging box and heavy breakable cast grades are unchanged at $27-$28.

With steelmaking operations easing, most scrap dealers see little likelihood of an early upturn in steel scrap prices. Mills inventories are being reduced, but stocks are still sizable, particularly for this season of the year, and foreign shipments continue to arrive in fairly good volume.

New York—Scrap brokers' buying prices are unchanged, with demand dull and little to test the market. While some traders believe prices generally are at bottom, others look for further downward adjustments, especially in steel grades, before the market turns upward.

Buffalo — Weakness gripped the scrap market last week. Dealers continued to search for bids, but were able to move only meager lots. Small sales of blast furnace items were reported within prevailing ranges. Considerable resentment was expressed by local dealers over the refusal of Canadian government to grant import permits for scrap moving from the local area. This carryover wartime practice continues to affect Buffalo dealers while huge quantities of U. S. scrap is being shipped into Canada from eastern sources.

Cincinnati—Scrap quotations, although unchanged excepting for a $1 cut in short rails, are nominal in the current dull market. Shipments to mills are on a curtailed level, those to foundries also are light, indicating the light melt on castings. Dealers are less active and, even though they are dissatisfied with prices, they are not likely to hold large tonnages on speculation.

Birmingham—The scrap market is described here as being "completely in the doldrums." There is little agreement as to actual prices, the largest buyer being out of the market at least until next month.

St. Louis—Scrap prices in this district remain nominal with sales practically nonexistent. Mill reserves are comfortable with shipments on unexpired orders meeting daily needs. There are signs, however, the latter condition won't prevail long, since rural collections are declining.

Los Angeles—Firming tendencies have made their appearance, and some observers believe the scrap market possibly has touched bottom in this district. Although posted prices are unchanged, deals within the trade are bringing higher quotations. Dealers report mill inquiries regarding purchase of larger tonnages than have

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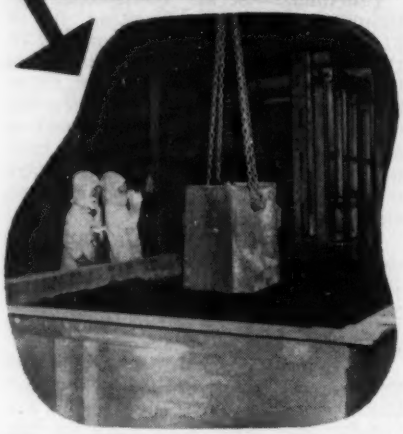

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been called for in some months. Only a little material currently is available in local yards, because collections have fallen off to a trickle due to the drop in prices. No. 1 cupola cast is holding at $25-$30, although demand is meagre for foundry iron.

San Francisco—The lull in mill buying of domestic scrap continues and, although prices have not changed since the first of this month, the undertone is soft. The strike-caused week's shutdown of Columbia's mill at Pittsburg, Calif., will have an effect on further weakening demand. Dealers report collections have slowed considerably.

Seattle—Steel scrap prices took another nose dive this week, mills on May 19 announcing a drop from $22 to $17 for No. 1 and No. 2 heavy melting, f.o.b. plant, Seattle. On shipments from outside Seattle, mills will absorb 50 per cent of the rail freight. No. 1 and No. 2 bundles dropped from $18 to $15 and other scrap items in proportion. Considerable material is enroute at former prices. Bethlehem's Seattle mill expects a cargo of 8,000 tons of prepared scrap from the Philippines in June. Mills report receipts are ample for current requirements and there is no inclination to expand inventories beyond a reasonable margin in view of the overall outlook.

Foundries in this area, operating at about 50 per cent of capacity, have no materials problems at present but are concerned about obtaining new business. Cast iron is quoted at $20 to $25, according to quality, while pig iron is available in ample tonnages for present needs.

Mill Equipment Builders Busy

Pittsburgh—Builders of steel mill equipment report order backlogs have been reduced in recent months, although not nearly to the extent of other industrial lines. Most interests have sufficient business on hand to sustain present high level operations through remainder of this year. Bulk of new orders is originating from foreign sources and still further improvement in this business is indicated over coming months with clearance by ECA of foreign government steel mill expansion programs.

Iron Ore . . .

Iron Ore Prices, Page 104

Cleveland—Consumption of Lake Superior iron ore declined during April to 7,321,856 tons from 7,734,760 tons in March and compared with 4,976,069 tons in April, 1948, according to the Lake Superior Iron Ore Association, this city. This brought the total for the first four months to 29,639,512 tons compared with 25,107,565 tons in the like 1948 period, including United States consumption of 28,698,847 tons and 24,137,181 tons in the respective periods.

Total stocks as of May 1 amounted to 17,802,854 tons compared with 17,308,374 tons as of April 1 and 17,124,962 as of May 1, 1948. Of the May 1 total, 14,863 tons were at furnaces and 2,033,169 tons on Lake Erie docks in the United States and 906,017 tons at furnaces in Canada.

As of May 1, 175 furnaces were in blast and 10 idle in the United States compared with 177 and 8, respectively, a month ago; 162 and 20, respectively, a year ago. In Canada, 9 were in blast and 1 idle on each of the three dates.

As of May 15, the American Great Lakes ore fleet totaled 266 boats having a trip capacity of 2,622,250 tons, based on 20-foot draft. All boats were in commission and all but one, owned by Wilson Transit Co., were in the ore trade.

Warehouse . . .

Warehouse Prices, Page 105

Salt Lake City, Utah—Structural Steel & Forge Co. has made an average reduction of $5 a ton in its warehouse price of steel products. They will range as high as $15 a ton on plates and structural shapes.

The reductions, according to Morris Rosenblatt, president, were made possible when Geneva Steel Co. made available larger tonnages of products to Salt Lake City and inter-mountain warehouses. Mr. Rosenblatt pointed out that the reductions bring warehouse prices here to a lower level than jobber prices in Chicago for similar products produced in the Chicago district.

Pittsburgh—Carnegie-Illinois Steel Corp. was one of the last major producers to raise distributors' discount from 5 to 10 per cent on stainless sheets, hot-rolled bars, plates and shapes, effective May 12. Prior to initial price action last year of discontinuing distributors' discounts, 10 per cent was granted on sheets; 7½ per cent on hot-rolled bars, plates and shapes; 5 per cent on cold finished bars, strip and wire. In the interim the industry rescinded this action to extent of granting distributors a discount of 5 per cent and permitting them to combine products of identical gage in standard widths and lengths to obtain higher quantity discounts. Latest price action reverts to old selling practice on quantity discounts. Upward adjustment in discount on cold-finished bars, strip and wire soon is expected to be made by major producers.

Chicago — Warehouse business, while having undergone a drastic change in the past several months, is still far from being on a normal basis. Stocks in the aggregate are greater than previously but are still out of balance in all flat-rolled carbon products and are especially low in galvanized sheets and plates. More effort, however, is made by every distributor to fill all the items on the lists given them, but with buying now done to a great degree on an immediate-delivery basis complete filling of every order is not possible. One of the major factors presently thwarting attempts to maintain adequate stocks of hot and cold-finished bars and bar - size shapes is the widening gaps in mill rolling schedules for individual sizes. One warehouseman reports that certain sizes which used to be rolled at six to

eight-week intervals are now being scheduled for rolling at up to 12-week intervals, a situation which is resulting in large stocks of a given size soon after the rolling and virtual exhaustion of stocks for a considerable period before the next. Warehouses continue to get offers of substantial tonnages of steel, particularly sheets, from customers who are reducing inventories, trying to unload steel taken on irrevocable commitments, etc. One reported last week having turned down a very attractive offer, pricewise, for wide 10-gage hot-rolled sheets in coils from a large manufacturer who had presumably received the material under a conversion arrangement. Most offerers of similar material now are reconciled to taking a loss on unneeded material of this type, since they are not willing to spend the money required for freight charges from the finishing mill or make further payments for storage when all indications point to a better supply of mill steel in third quarter.

Cincinnati—Warehouse stocks will be in balance, on prewar standards, within two or three weeks. Supplies of some items had been excessive, but adjustments in tonnages are near completion. Sales are holding to recent volume, with the trend toward reduction in size of individual orders and early delivery demanded.

Birmingham—Warehouse men say demand is "relatively good." It has tapered off a little, but bars, small shapes, plates and sheets remain strong. A "little more steel" is being allocated warehouses, although steel mills say their heavy bookings precludes much larger allocations.

Los Angeles—Jobbers report more active buying of steel products, which they attribute to depletion of inventories by many of their customers. Some of these plants, however, are able to pick up odd tonnages of surplus inventory offered by other fabricators at market or less. Warehouse stocks generally are adequate in all categories, with the exception of galvanized. Supplies are well enough balanced that some jobbers are able to refuse offered sheet tonnages.

San Francisco—A survey of steel jobbers in this area indicates their business declined an average of 35.5 per cent in the first four months this year as compared with the like period of 1948.

This rate of decline is slightly larger than in the first quarter, indicating further retraction of business in April. No pick-up developed in May. Warehousemen attribute the decline to the hand-to-mouth buying policy of all consumers.

Seattle—Wholesale jobbers, in view of the easier supply situation, expect to have complete stocks by August, for the first time since before the war. Mills are accepting orders for June-July shipment of sheets and the potential supply of plates appears to be equal to current demands. Alloy items are quiet, due in some measure to restricted logging operations in this area. Interests who overbought these items have dumped surplus on the market. Jobbers report May volume better than that in April, although there is every indication that it has changed from a sellers' to a buyers' market. Nails are easier and other items, recently short, are in improved supply.

Canada . . .

Toronto, Ont.—March production of iron and steel in Canada was at the highest monthly record in history. Pig iron output at 202,130 net tons indicated a daily average rate of 86.7 per cent of total rated capacity and compares with a rate of 82 per cent for February and 74 per cent for March, 1948. March output included 165,190 tons of basic iron, 19,201 tons of foundry iron, and 17,739 tons of malleable iron.

With 12 of the 14 blast furnaces in Canada blowing, charges to these furnaces in March included 367,601 tons of iron ore; 34,175 tons of mill cinder, scale, sinter, etc., and 9717 tons of scrap.

Production of steel ingots and castings in March was at the record rate of 298,461 net tons, or at an average of 92.6 per cent of rated capacity compared with 89.1 per cent for February and 88.8 per cent for March, 1948. Production for March included 287,885 tons of steel ingots and 10,576 tons of steel castings.

Charges to steel furnaces in March included 160,587 tons of pig iron, 82,002 tons of scrap of consumers' own make and 90,102 tons of purchased scrap.

Ferroalloys produced in March totaled 22,457 net tons.

Following are comparative production figures in net tons:

	Steel Ingots Castings	Pig Iron	Ferro-alloys
Mar. 1949.....	298,461	202,130	22,457
Feb. 1949.....	259,271	172,724	21,713
Mar. 1948.....	286,026	172,675	14,293
3 Mos. 1949...	842,439	557,928	66,101
3 Mos. 1948...	782,398	483,840	43,241
3 Mos. 1947...	748,752	492,348	33,198

REINFORCING BARS . . .

REINFORCING BARS PLACED

125 tons, grain elevator, Morrow, Oreg., to Northwest Steel Rolling Mills Inc., Seattle; Central Construction Co., Spokane, Wash., general contract.

100 tons, addition to Jane Addams school, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, improvements, Elelson air field, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, two grain elevators, Eastern Washington, to Bethlehem Pacific Coast Steel Corp., Seattle; Henry George & Sons, Spokane, general contract.

REINFORCING BARS PENDING

255 tons, Schooner Bayou control structure, Vermilion parish, La.; bids June 17 to Corps of Engineers, New Orleans; also 200 tons of sector gates and machinery.

Unstated, 200-foot Duwamish river bridge, Kings county, Wash.; plans approved; bids soon.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4200 tons, Elizabeth, Pa., bridge, Pennsylvania state highway project, to Fort Pitt Bridge Works, Pittsburgh.

2700 tons, Pennsylvania railroad freight ter-

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minal at Pittsburgh, to Ingalls Iron Works Co., Birmingham.

325 tons, two turbogenerator foundations, Delaware Power & Light Co., Edgemoor, Del., to Bethlehem Steel Co.

325 tons, hospital addition, Rockefeller Institute for Medical Research, 66th St. and York Ave., New York, to Grand Iron Works Inc., that city.

266 tons, grandstand, Billings, Mont., to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

200 tons, bridge, Department of Public Works, Bronx, New York, through Peerless Construction Co., to Harris Structural Steel Co., that city.

182 tons, state bridge, proj. F-002-2(3), Larkspur, Colo., to Midwest Steel & Iron Works Co., Denver.

100 tons or more, 100-ton bridge crane and 10-ton traveling crane for Seattle city light, to Cyclops Iron Works, San Francisco, low $41,715.

100 tons, St. Anthony's Church, Union City, N. J., to Grand Iron Works Inc., New York.

STRUCTURAL STEEL PENDING

1700 tons, apartment, School House Lane, Philadelphia, Turner Construction Co., general contractor; bids closed last week.

455 tons, state highway bridge, sec. 4-2-F, Carmi, White county, Illinois; Allied Structural Steel Co., Chicago, low.

400 tons, textile plant, Broad Brook, Conn.; bids in.

315 tons, deck welded girder bridge over New Haven railroad, Middletown, Conn.; bids June 6, Hartford; also 90 tons, three-span I-beam bridge, Danbury, and 50 tons, welded composite girder bridge, Beacon Falls, Conn.

222 tons, state highway bridge, sec. 34-2-1-SF, Danville, Vermilion county, Illinois; Milwaukee Bridge Co., low.

221 tons, state highway bridge, sec. 117-1-SF, Litchfield, Montgomery county, Illinois; Milwaukee Bridge Co., low.

200 tons, state bridge, Cranford Township, Union county, New Jersey; bids June 9.

200 tons, also 75 tons reinforcing, Emerson St. viaduct, Seattle; bids to Port of Seattle, June 1.

200 tons, high school gymnasium, Stratford, Conn.; bids in.

200 tons, grade crossing eliminations, Cranford, N. J.; bids June 9, Trenton.

175 tons, state bridge work, Crawford county, Pennsylvania; bids June 17.

174 tons, state highway bridge, sec. 1F, Carmi, White county, Illinois; Milwaukee Bridge Co., low.

150 tons, hospital building, New Milford, Conn.; bids June 1.

105 tons, state bridge work, Lehigh county, Pennsylvania; bids June 17.

Unstated, railroad bridge, East low canal, Columbia Basin project; bids to Bureau of Reclamation, Denver, June 7; Spec. No. 2643.

PLATES . . .

PLATES PLACED

170 tons, water storage tank, College Place, Wash., to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh.

Unstated, water storage tank for King county district No. 14, Seattle, to American Pipe & Construction Co., Portland, Oreg.

PIPE . . .

STEEL PIPE PENDING

Unstated, 1160 feet 30 inch steel pipe; bids to Fish & Wildlife Service, Portland, Oreg., May 17.

CAST IRON PIPE PENDING

510 tons, 8 to 16-inch, water division, district government, Washington; bids in.

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any span or lift—5 to 150 tons

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CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM—Alabama Appliance Co. Inc., c/o contractor, has awarded a $100,000 contract to T. C. Brasfield, 3021 Sixth Ave. S., for construction of a warehouse and office.

ARKANSAS

CAMEL, ARK. — Arkansas-Missouri Power Corp. will build a $8 million steam electric generating plant.

CALIFORNIA

HAYWARD, CALIF.—Atlas Imperial Diesel Engine Co., 1000 19th Ave., Oakland, Calif., has awarded a $135,000 contract to Larsen & Larsen, 629 Bryant St., San Francisco, for construction of the second portion of a factory; Douglas, McLellan & Associates, 816 W. Fifth St., Los Angeles, architect; H. M. O'Neil Co., 610 16th St., Oakland, engineer.

LOS ANGELES—New shipping facilities are to be constructed by Los Angeles Board of Harbor Commissioners at cost of $9,153,000. Project includes a passenger and cargo terminal for the West Basin, $5,800,000; wharf and transit sheds, $2,458,000; incinerator plant, $250,000; and fencing, gates, and floodlights.

LOS ANGELES — Beverly Hills Development Co., 145 S. Rodeo Dr., Beverly Hills, Calif., has awarded a $400,000 contract for W. & J. Sloane Co., to Harold Roach, 4285 Huntington Dr., for construction of a warehouse.

SAN FRANCISCO—Recreation Commission of city and San Francisco county, City Hall, will spend $1,359,873 in field houses for playgrounds at Potrero Hill Playground, St. Mary's Playground, Oceanview Playground and Sunset Playground.

CONNECTICUT

DANBURY, CONN.—Danbury Industrial Corp., 205 Main St., has awarded a $125,000 contract to Hewlett Construction Co., 600 Lindley St., Bridgeport, and Bernard J. Dolan, 207 Greenwich Ave., Bethel, Conn., for construction of a factory, Shelter Rock Rd.

NEW BRITAIN, CONN.—Stanley Works has awarded a contract to Turner Construction Co., 420 Lexington Ave., New York, for an addition to its cold strip rolling mill; R. J. Willoughby, engineer.

FLORIDA

JACKSONVILLE, FLA. — Horne-Wilson Inc., 214 E. Bay St., has awarded a $160,000 contract to O. P. Woodcock, 420 W. Monroe St., for construction of a warehouse; Jefferson D. Powell, Atlantic Bank Bldg., architect.

MIAMI, FLA.—G. Goldberg, c/o contractor, has awarded a $100,000 contract to Chalker Construction Co., 343 S. W. North River Dr., for construction of a warehouse.

ILLINOIS

CHICAGO—Burny Bros., 2747 W. Van Buren St., will build a $700,000 plant, Chicago Ave. & Kilpatrick St.; L. P. Sumarkoff, 105 W. Madison St., architect.

DECATUR, ILL.—A. E. Staley Mfg. Co. has awarded a contract to Blaw-Knox Co., Pittsburgh, Chemical Plants Division, to supply processing equipment and engineering for a soybean extraction plant which the company will erect adjacent to its present extraction plant.

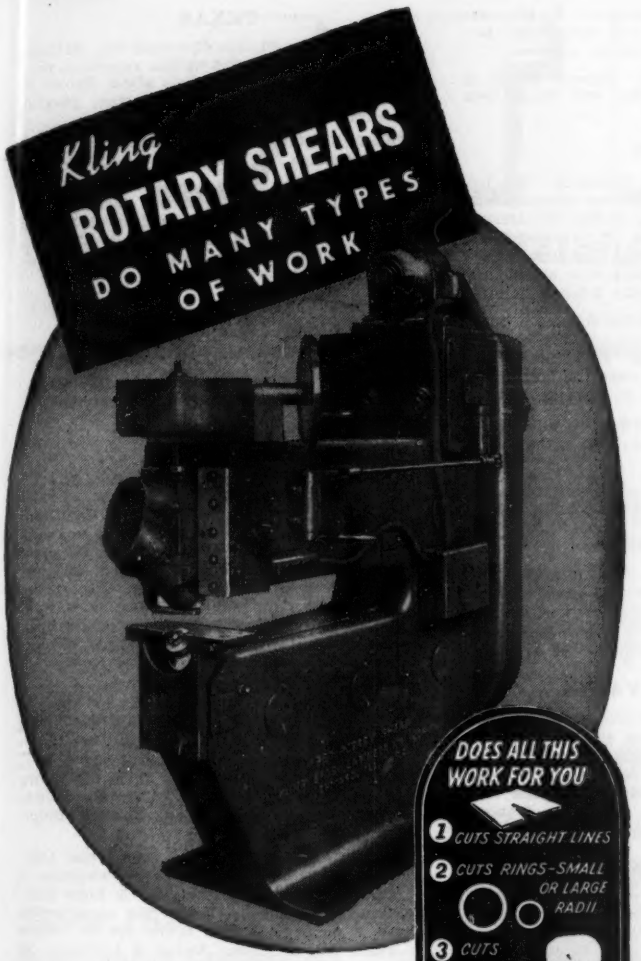
IOWA

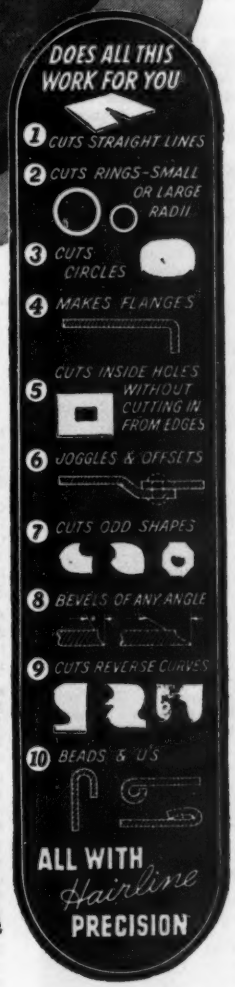
DES MOINES, IOWA—Farmers Grain Dealers Association of Iowa, 1101 Walnut St., has awarded a $530,000 contract to A. H. Newmann & Bros., Hubbell Bldg., for construction of a grain elevator.

KENTUCKY

LOUISVILLE—Whittenberg Construction Co., 2214 S. Floyd St., will erect a $1.7 million warehouse for A. & P. Tea Co.

LOUISVILLE—National Distillers Products,

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6 JOGGLES & OFFSETS
7 CUTS ODD SHAPES
8 BEVELS OF ANY ANGLE
9 CUTS REVERSE CURVES
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In metal-working plants, automotive, aviation, home appliance, and other industries, where work of this character is being done,—this machine is held in high regard for its versatility and economy of operation.

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which will give you specific facts, and specifications. No obligation involved. Users of heavy equipment of Kling Rotary Shears' class will receive a copy of this Bulletin promptly, on request.

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De Laval double reduction speed reducers, consisting of combinations of double worm gear reductions, or helical and worm gear reductions, are available with overall ratios up to approximately 8000 to 1. De Laval single reduction worm gear speed reducers are available in ratios up to 90 to 1. If high ratios are your requirement, worm gear speed reducers are the answer—particularly if space is limited and reliability is important. A De Laval representative will help you pick the right size and type.

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CENTRIFUGAL BLOWERS AND COMPRESSORS • IMO OIL PUMPS

1378 Lexington Rd., will build a $1.8 million warehouse; contract awarded to Sanderson & Porter, 1373 Lexington Rd.

MICHIGAN

LANCASTER, MICH.—Diamond Power Specialty Co., 10340 Oakland Ave., Detroit, will build a $2 million plant; Austin Co., 16112 Euclid Ave., Cleveland, engineer and architect.

MINNESOTA

DULUTH—W. H. Ziegler Co., 304 Lake Ave. S., has awarded a $220,000 contract to A. Hedenberg & Co., 4621 E. Superior Ave., for construction of a warehouse.

MISSOURI

SPRINGFIELD, MO.—M. T. A. Milling Co., 506 Boonville St., has awarded a $500,000 contract to Seth E. Giem & Associates, Land Bank Bldg., for construction of a plant.

NEBRASKA

NEBRASKA CITY, NEBR. — Butler-Welsh Grain Co., Grain Exchange Bldg., Omaha, Nebr., has awarded a $125,000 contract to Ryan Construction Co., 2606 Taylor St., Omaha, for construction of a grain elevator.

NEW JERSEY

RARITAN TWP., N. J.—Johnson & Johnson, 500 George St., New Brunswick, N. J., has awarded a $1.5 million contract to John W. Ryan Construction Co., 369 Lexington Ave., New York, for construction of a shipping center, warehouse and office; Fellheimer & Wagner, 155 E. 42nd St., New York, architect.

TRENTON, N. J.—Henry Clay & Back & Co. Ltd., 507 Grand St., has awarded a $100,000 contract to Campbell Bros., Grand Central Terminal Bldg., New York, for factory alterations; A. Francisco & Jacobus, 511 Fifth Ave., New York, engineer.

NORTH CAROLINA

BURLINGTON, N. C.—Burlington Mills has awarded a $317,810 contract to H. L. Coble Construction Co., Greensboro, N. C., for construction of a mill and warehouse; McMinn & Norfleet, Greensboro, architect.

CAMP LEJEUNE, N. C.—Bureau Yards & Docks, Marine Barracks, will build field house, $725,865.

OHIO

CLEVELAND—Standfast Products Co. has been incorporated by William Marcus, 2528 Mayfield Rd., president; Wilbur W. Merkel, 5 River Rd., Gates Mills, O., treasurer; and Robert W. Campbell, Union Commerce Bldg., secretary. It will manufacture plastic and metal products, principally kitchen utensils.

CLEVELAND—Earl F. Bahm Roofing & Sheet Metal Co., a new corporation, has acquired the former Bicker Bros. Sheet Metal Co., and will continue to operate the business at the same location, 4070 E. 82nd St.

CRESTLINE, O.—Schill Mfg. Co. will build a new plant to replace the building leveled by a $250,000 fire May 3.

MINGO JUNCTION, O.—Steel Service Inc. will build a warehouse and office building.

OKLAHOMA

STARR COUNTY, OKLA.—Continental Oil Co. plans enlargement of natural gasoline plant, 45 miles northwest of McAllen and 20 miles northeast of Rio Grande City, Okla.; cost, approximately $1.5 million.

PENNSYLVANIA

ERIE, PA.—General Electric Co. announces receipt of orders totaling $2,750,000 for the Locomotive & Car Equipment Division of the Erie Works. The orders, for locomotives and electrical equipment, came from Chilean State Railway, Canadian National Railway, and Detroit Street Railway.

TENNESSEE

MEMPHIS, TENN.—W. T. Rawleigh Co., Freeport, Ill., has awarded a $250,000 contract to H. F. Van & Sons for addition to factory, Illinois St.; Anker F. Hansen, architect; Ralph R. Wilson, associate architect.

TEXAS

ETTER, TEX.—Phillips Chemical Co., Bartlesville, Okla., has a $16 million expansion program underway at ammonia plant; Brown & Root, 4300 Calhoun Rd., Houston, general contractor.

HOUSTON—Humble Oil & Refining Co. reports fire damage to warehouse estimated at $100,000.

SAN ANTONIO, TEX.—Sinclair Refining Co., 1305 S. Laredo St., will build three $75,000 service stations at S. Flores & Compton Sts., Melrose & McCullough Sts., and Commerce & Pine Sts.

UTAH

SALT LAKE CITY, UTAH—Lundin & May Foundry Co. Inc., 454 W. Fifth North St., will build a $70,000 foundry; W. E. Nelson, Utah Savings & Trust Bldg., architect.

CANADA

TORONTO, ONT. — Imperial Oil Ltd., 56 Church St., has awarded a contract to Steel Co. of Canada Ltd., Wilcox St., Hamilton, Ont., for 67,000 tons of steel plate; to Page-Hershey Tubes Ltd., Welland, Ont., for plate fabricated into 457 mi, 16 in. pipe; to Railway & Power Engineering Corp. Ltd., Three Rivers, Ont., for pump for pumping station. These contracts, approximating $9 million, are awarded by Imperial Oil Ltd. for extension of service in Alberta and Saskatchewan.

ARVIDA, QUE.—Aluminum Co. of Canada Ltd., Sun Life Bldg., Montreal, Que., has awarded a $1 million contract to Foundation Co. of Canada Ltd., 1900 Sherbrooke St. W., Montreal, for construction of a laboratory and auditorium; Barott, Marshall, Montgomery & Merrett, Canada Cement Bldg., Montreal, architect.

MONTREAL, QUE.—Quebec Enterprises Ltd., 204 W. Notre Dame St., has awarded a $125,000 contract to Barnabe & Sons Ltd., 7615 St. Laurence Blvd., for construction of a factory; M. W. Roth, 204 W. Notre Dame St., architect; Archer & Dufresne, 25 St. Louis St., Quebec City, Que., engineer.

PRICES OF LEADING FERROALLOY PRODUCTS

(*Continued from Page* 105)

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Grainal: Vanadium Grainal No. 1, 93; No. 6, 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W. or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate alowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, M 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb or alloy; ton lots 18.00c; les ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.ob. Langeloth and Washington, Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo., f.ob. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.